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# THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

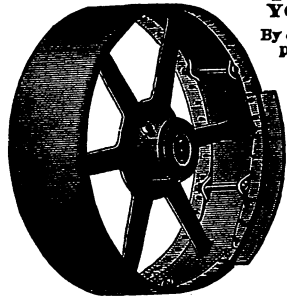
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Advertising and Subscription Rates " 833

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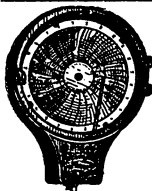
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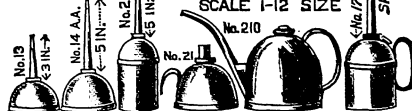
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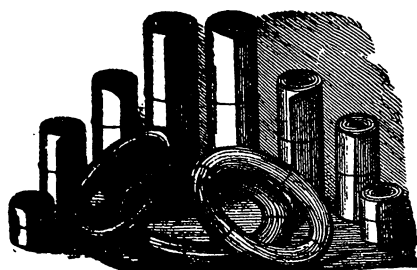
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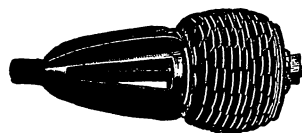
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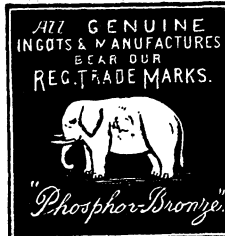
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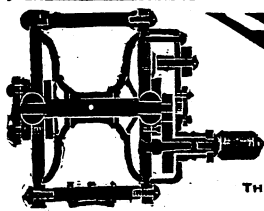
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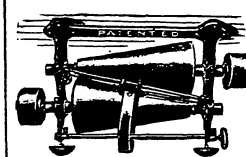
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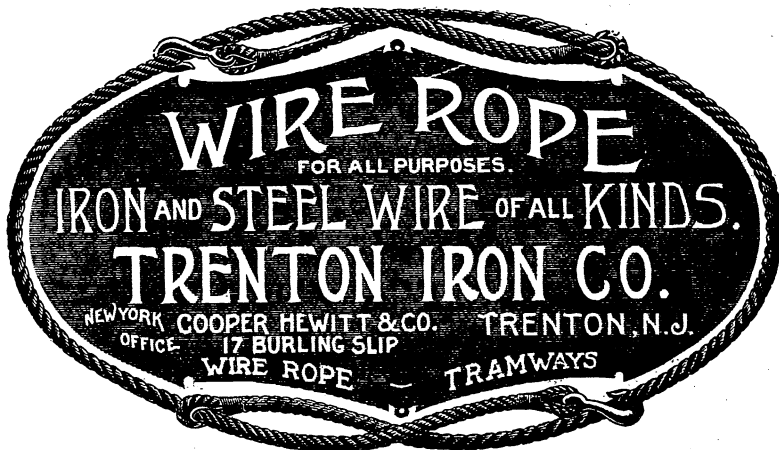
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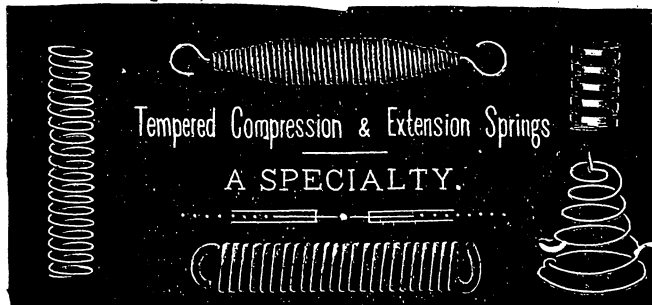
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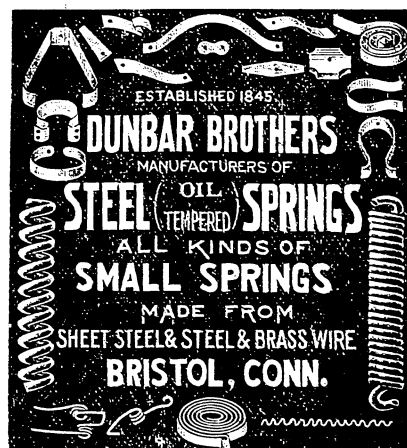
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**E. B. STOCKING, Attorney at Law,**  
611 F ST., N. W. WASHINGTON, D. C.

## PATENTS.

H. W. T. JENNER, Patent Attorney and Mechanical Expert. 519 Seventh St., Washington, D.C. Charges moderate. Write for terms. Established 1883.

## CHARLES N. BUTLER, C.E.,

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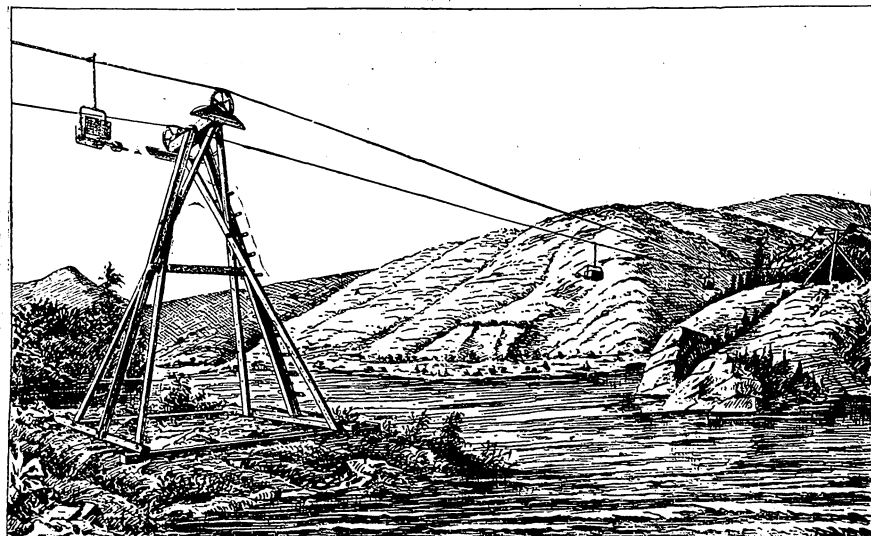
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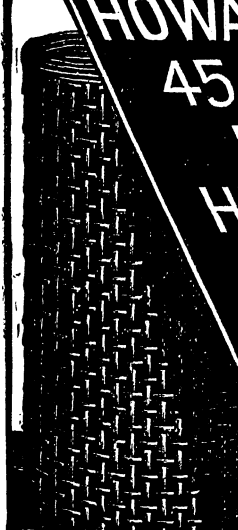

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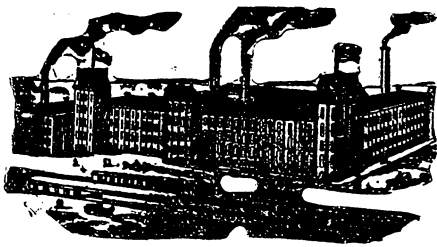
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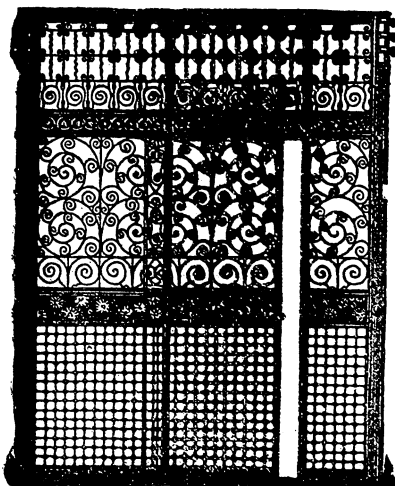
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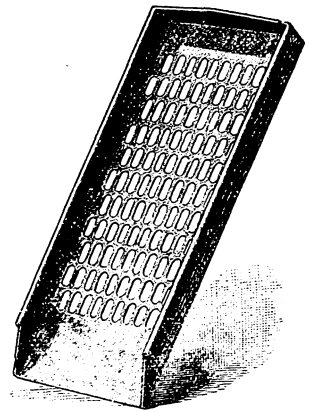
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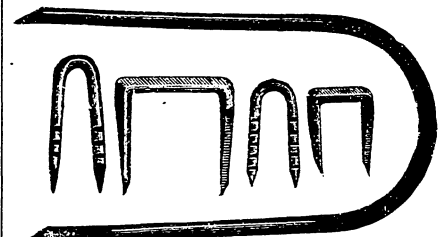
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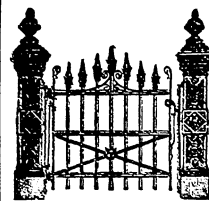
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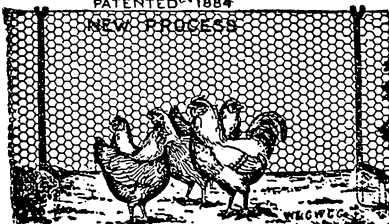
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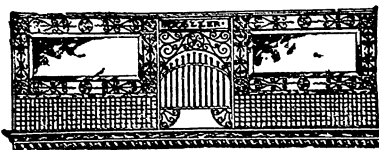
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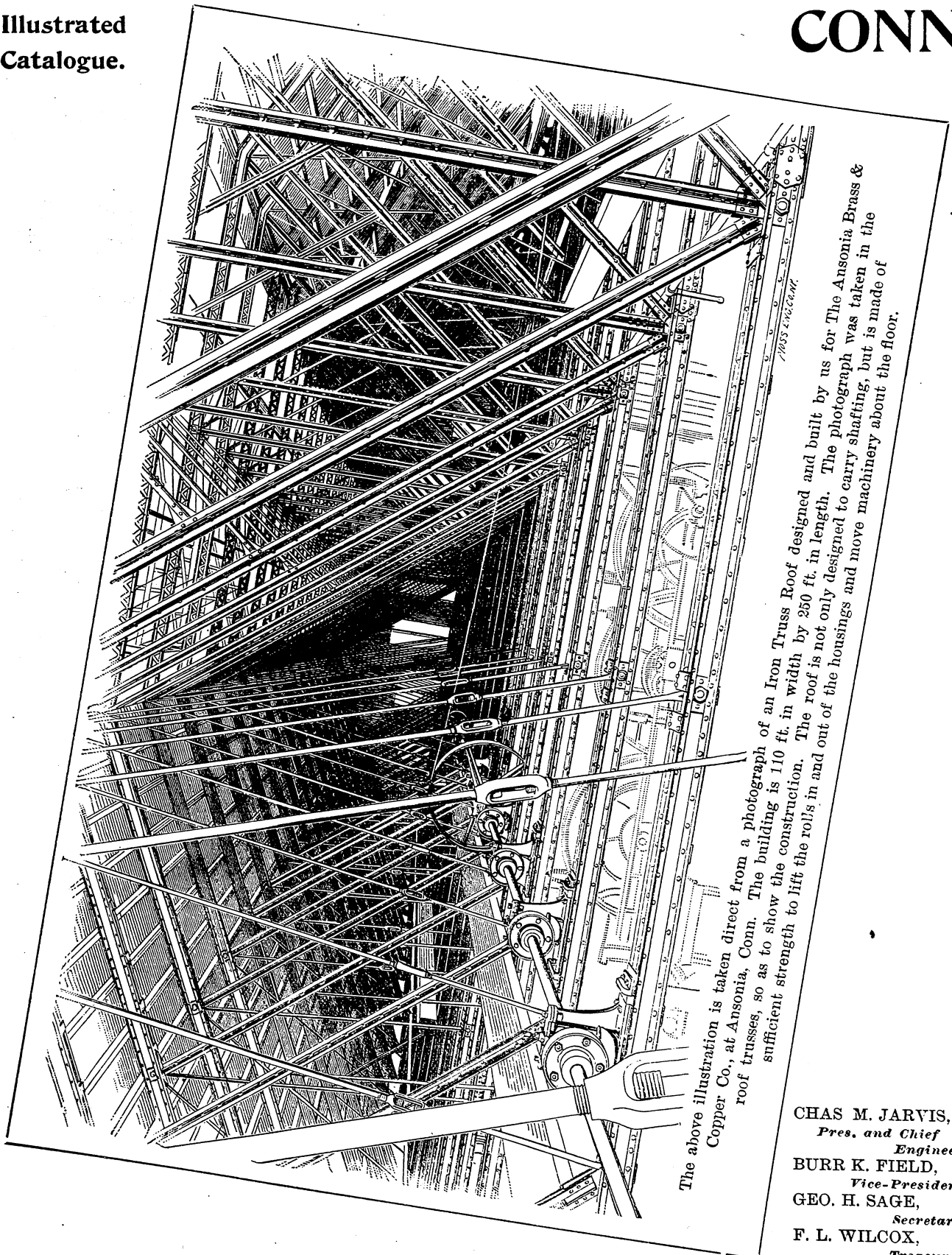
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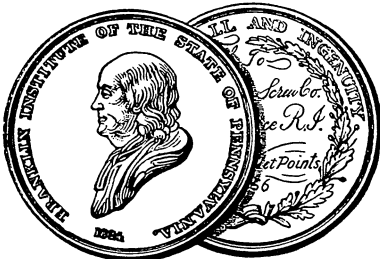
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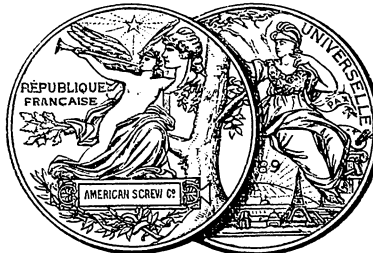
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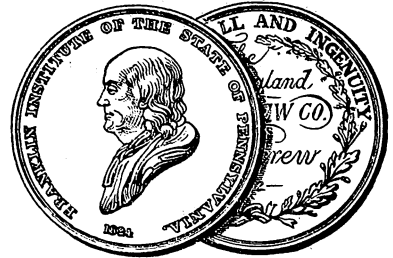
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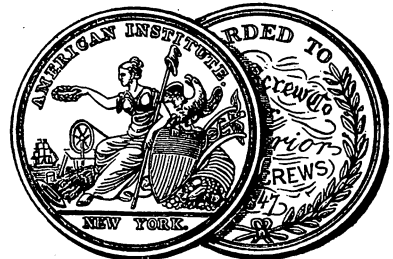
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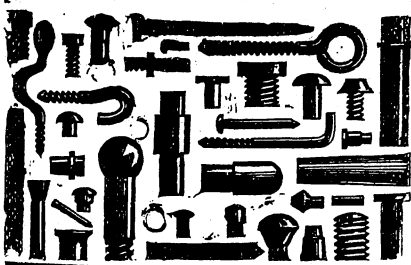
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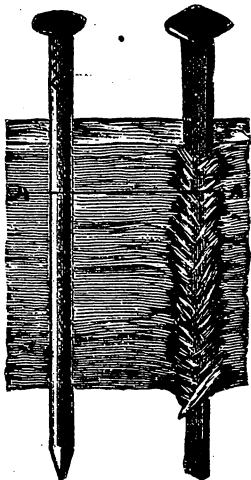
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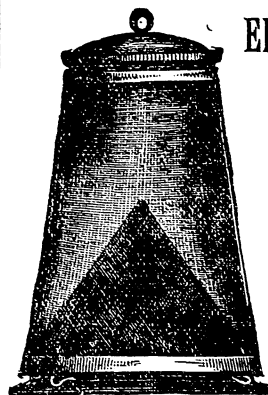
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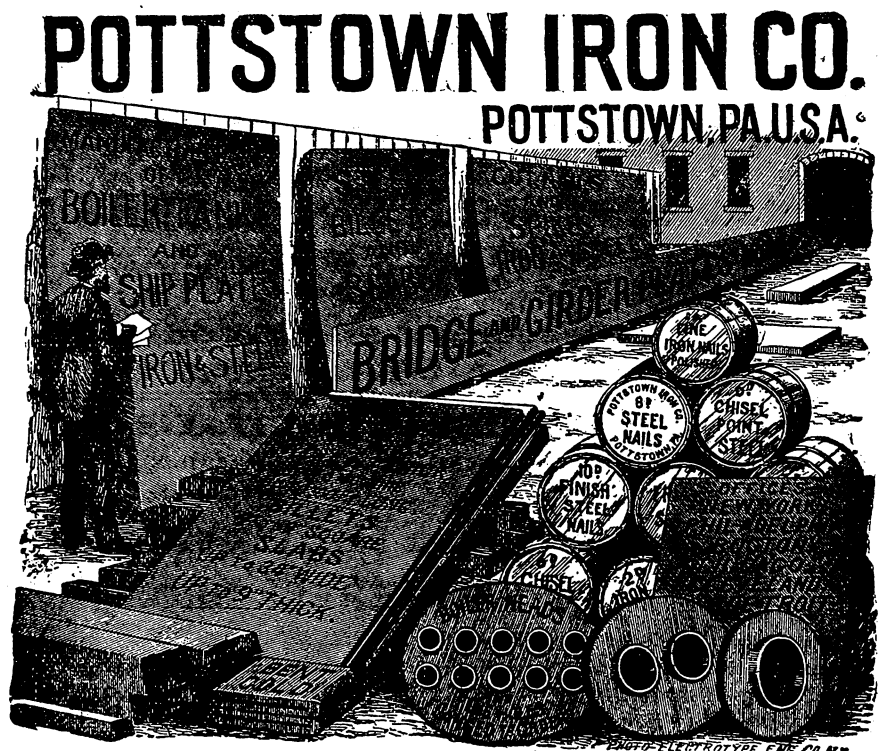
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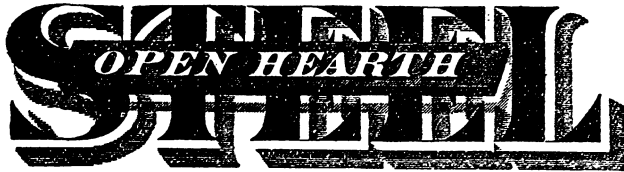
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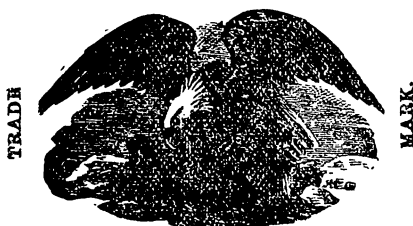
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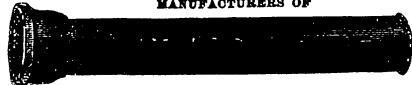
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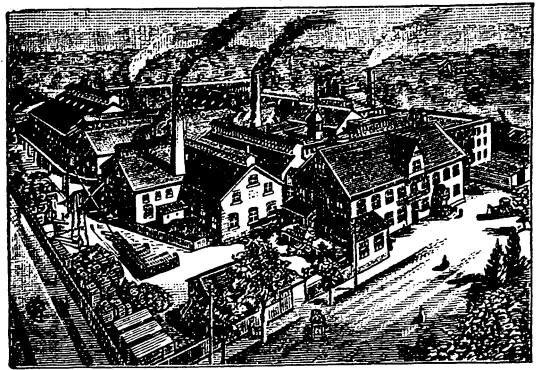
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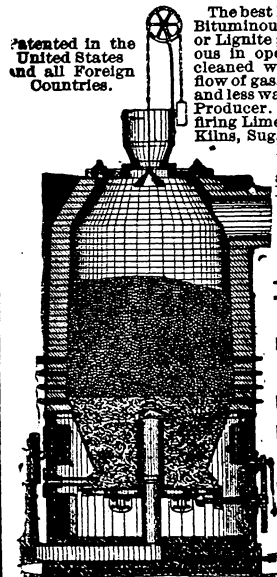
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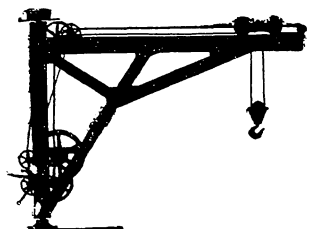


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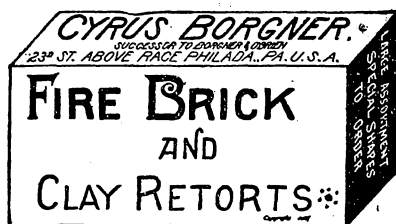
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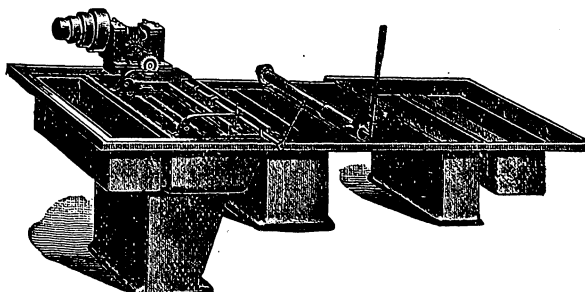
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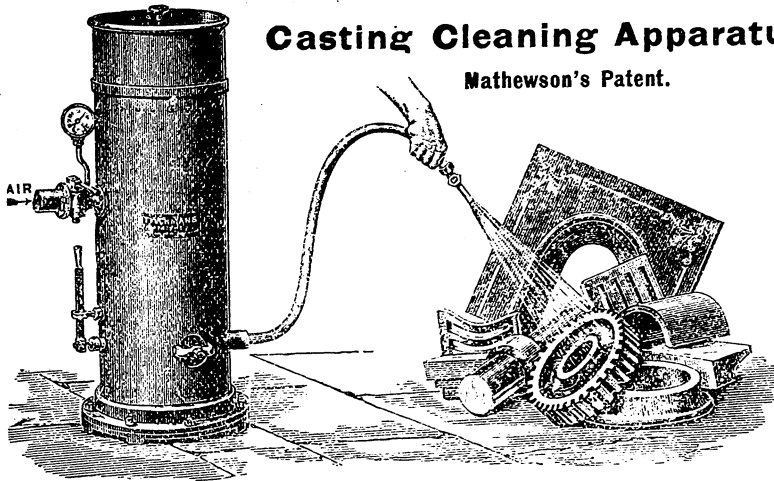
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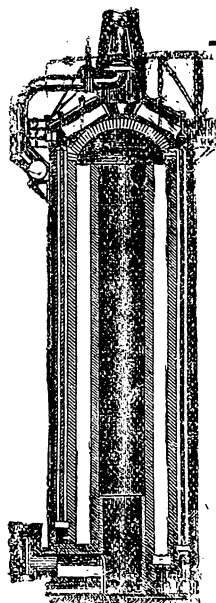
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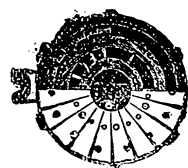
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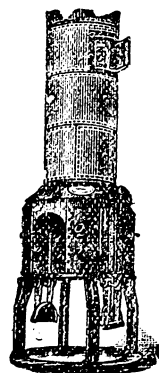
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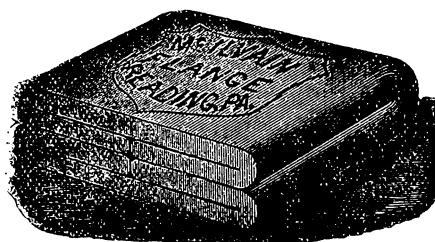
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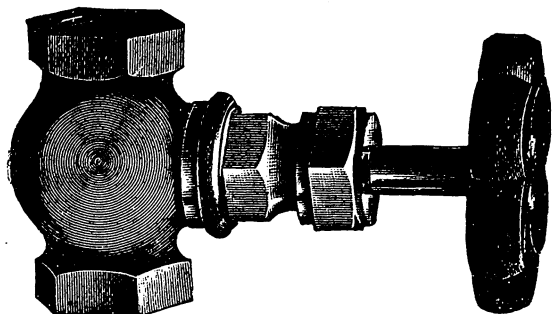
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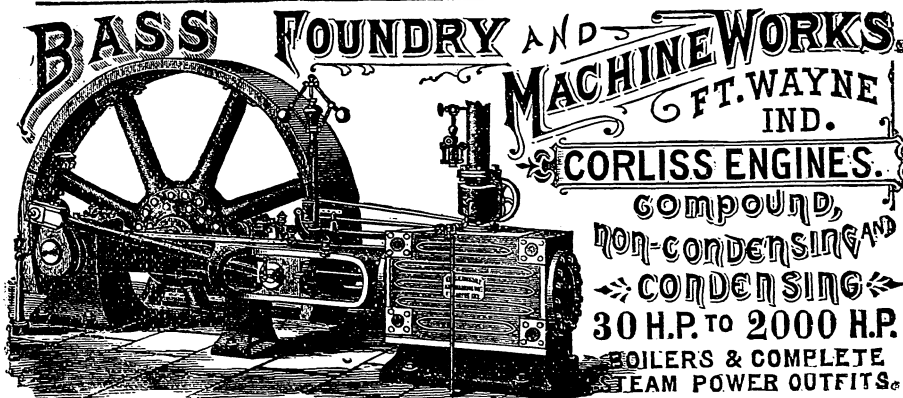
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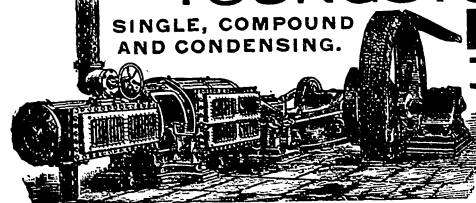
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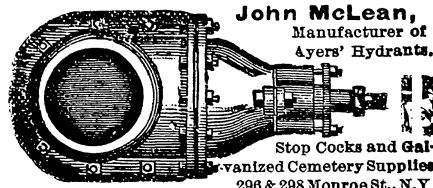
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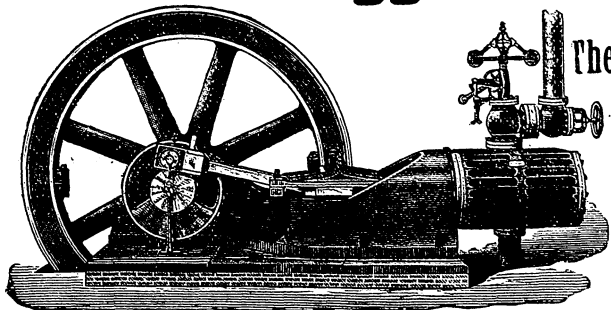
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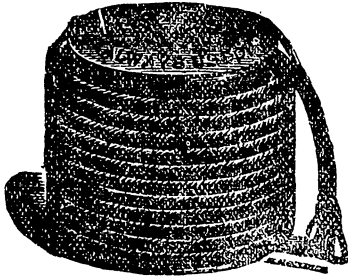
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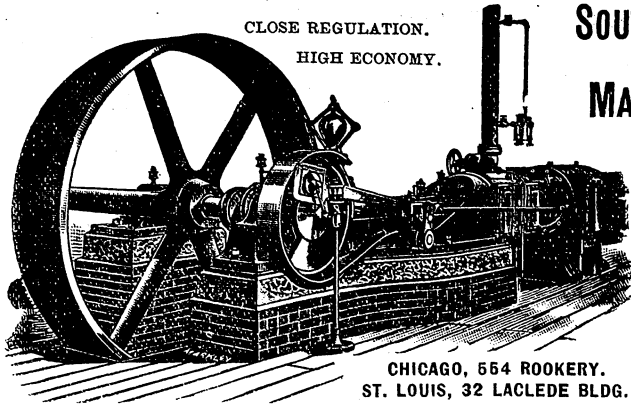
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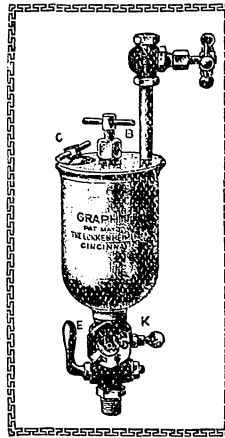
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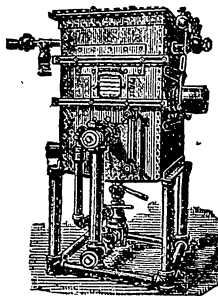
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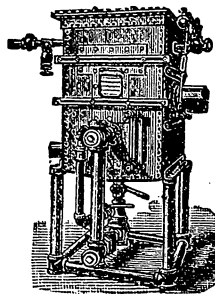
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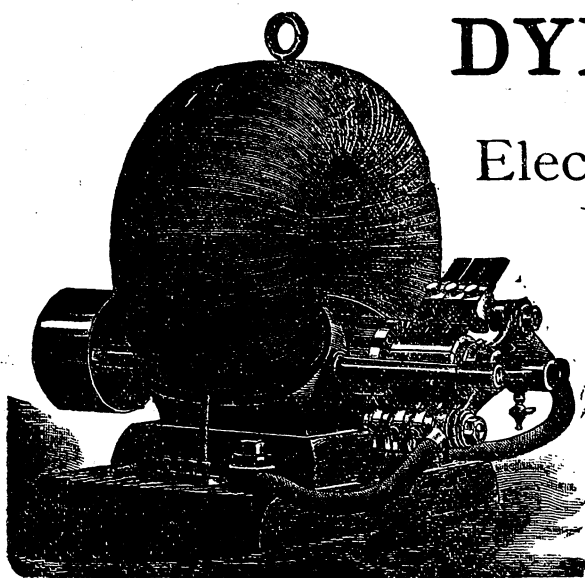
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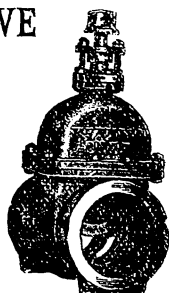
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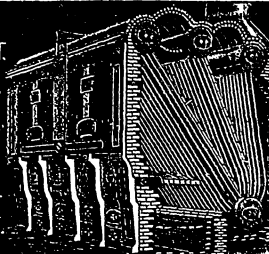
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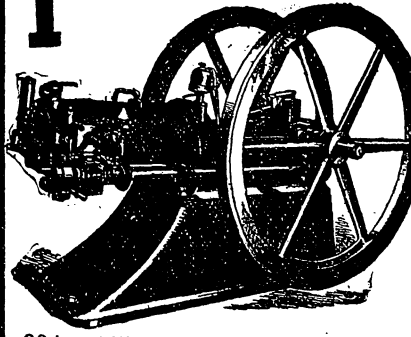
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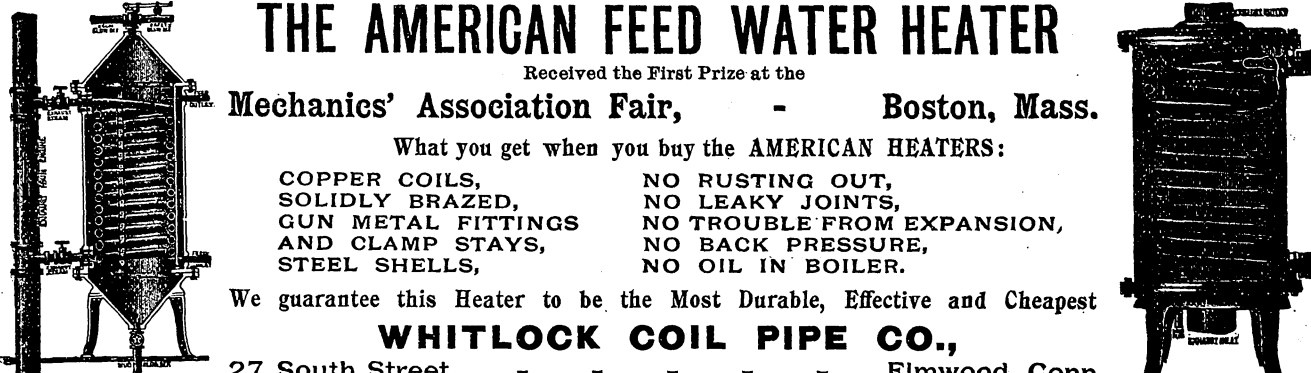
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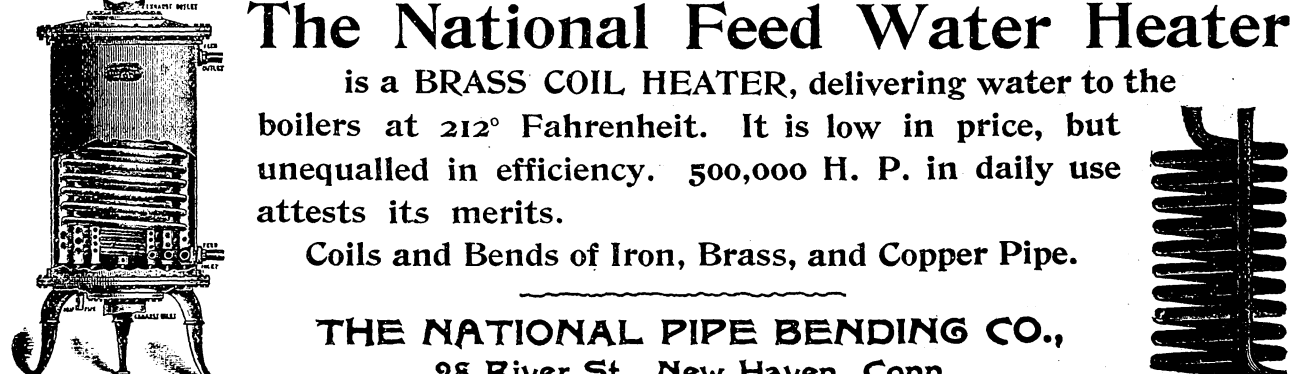


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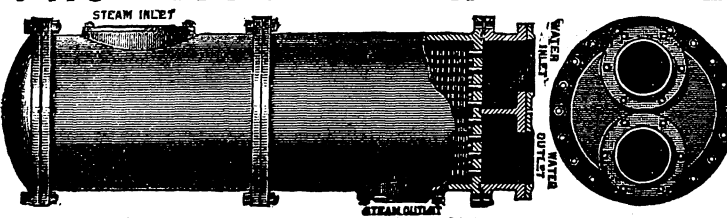
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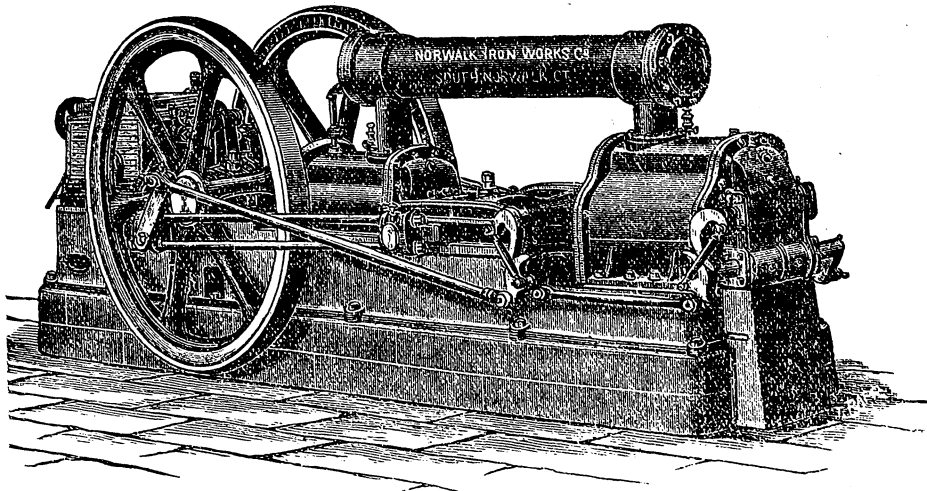
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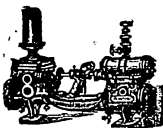
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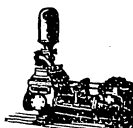
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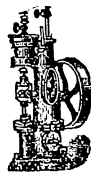
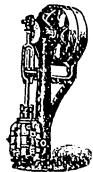
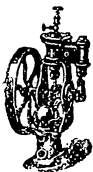
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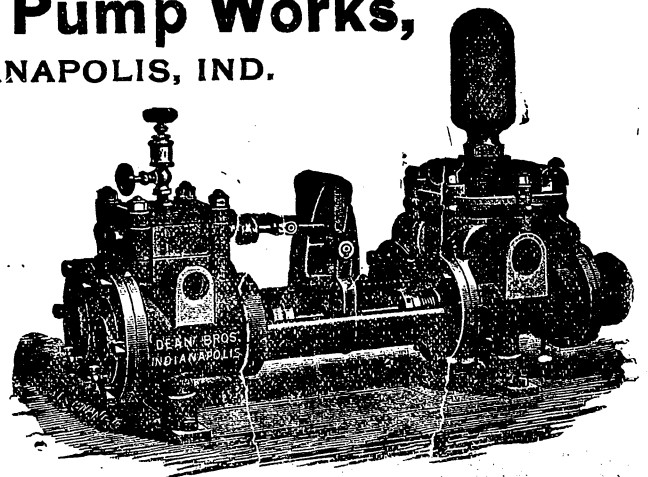
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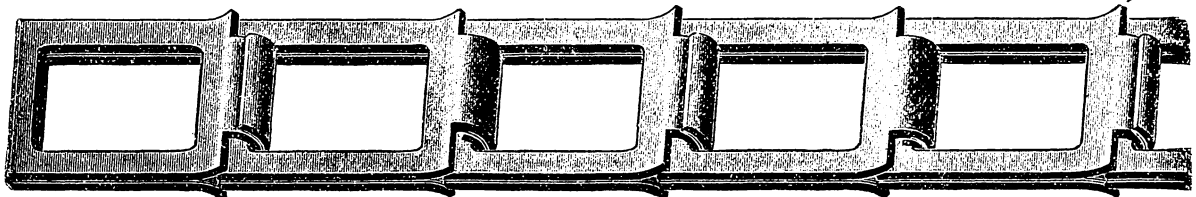
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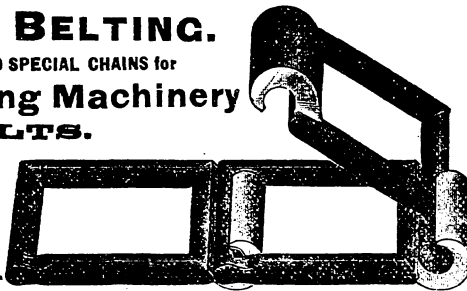
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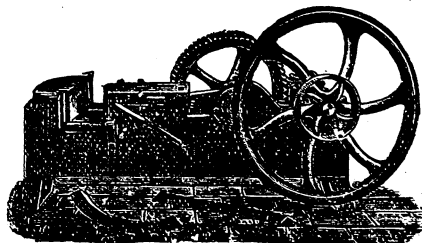
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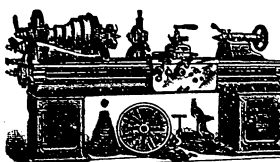
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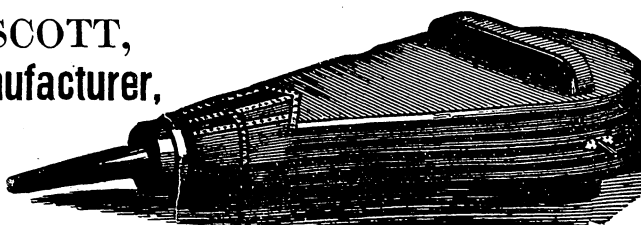
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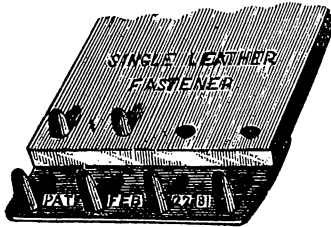
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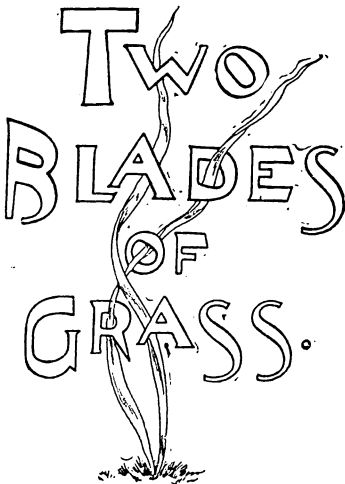
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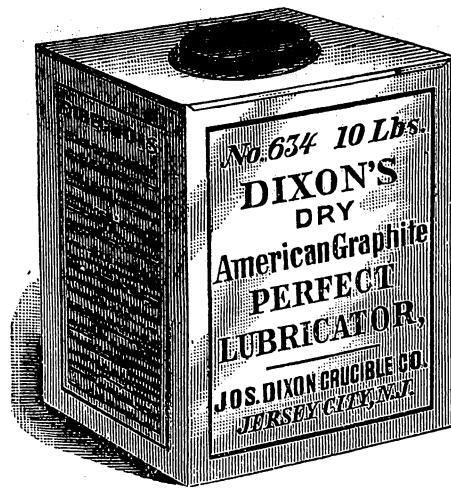


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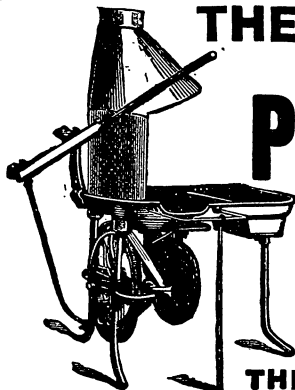
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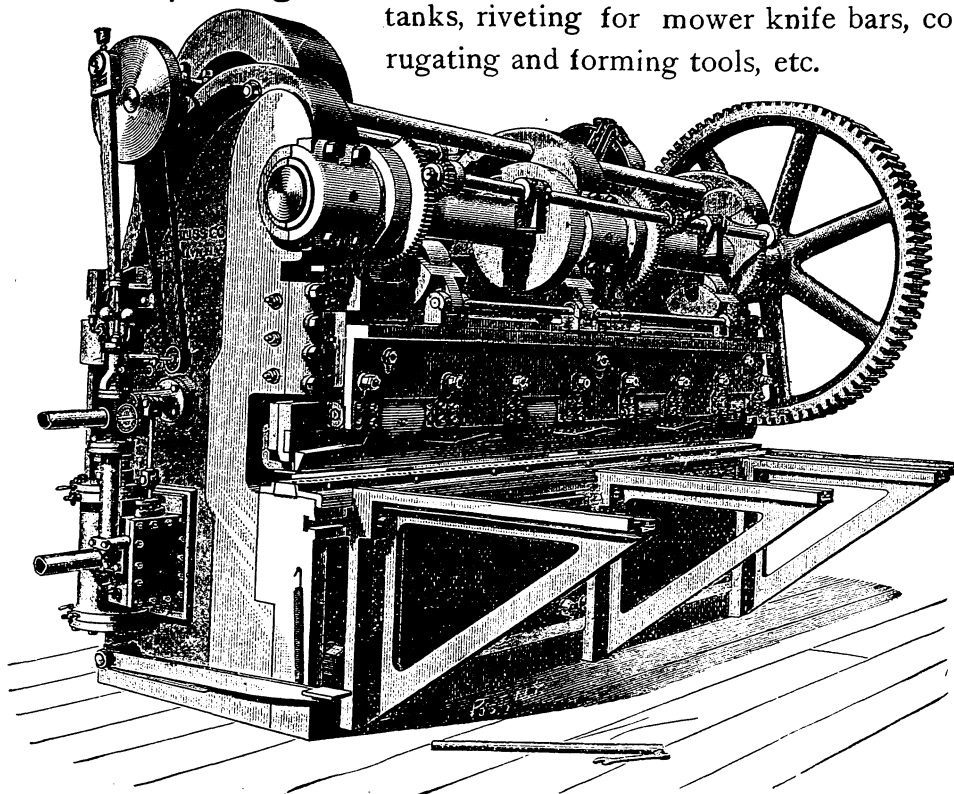
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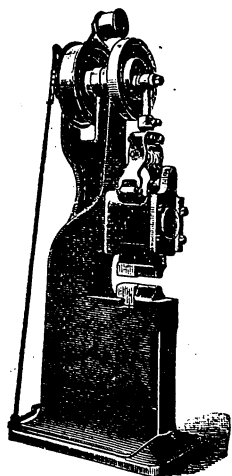
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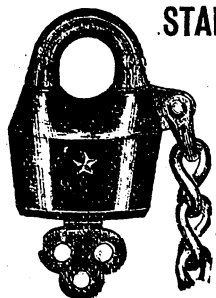
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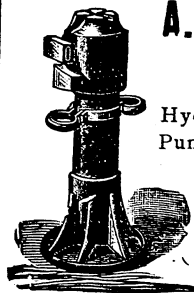
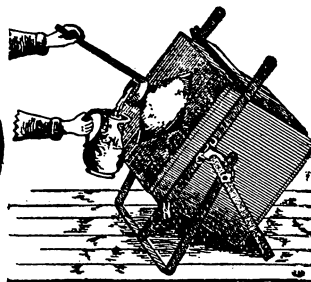
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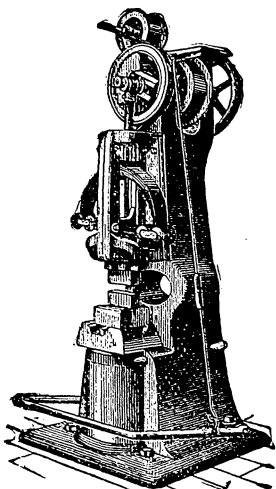
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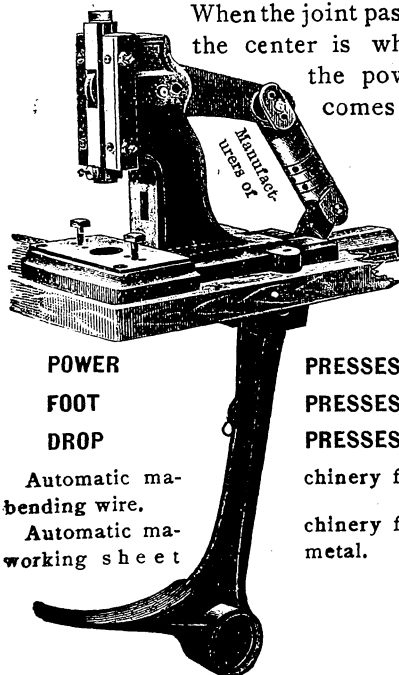
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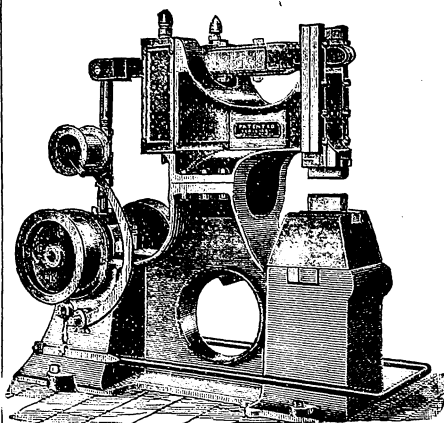
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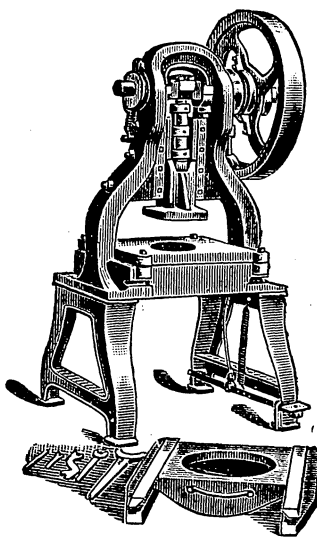
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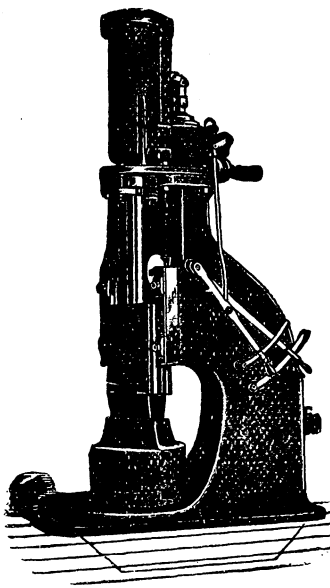


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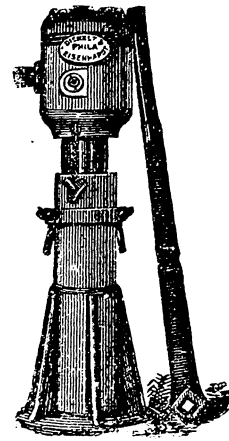
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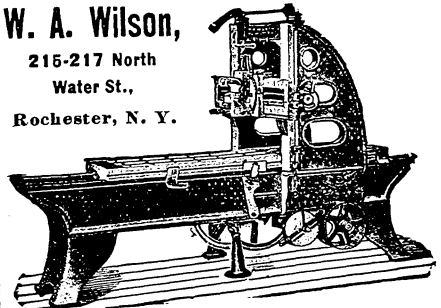
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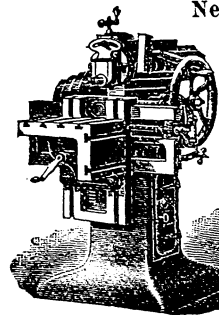


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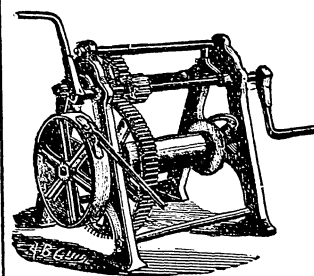
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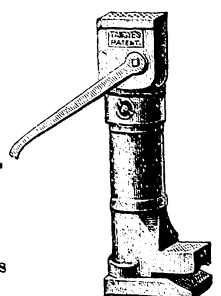
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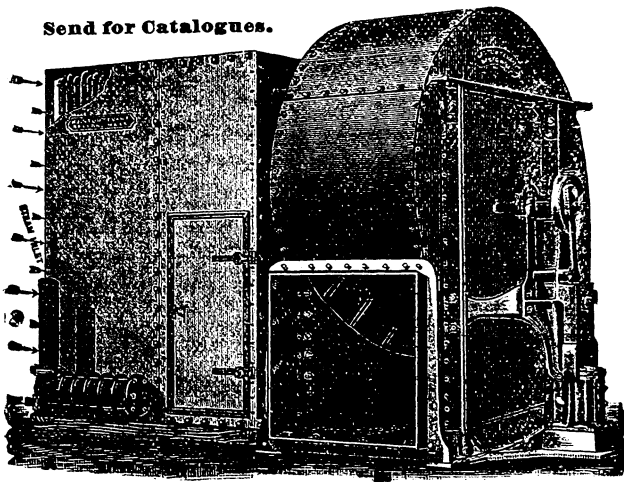
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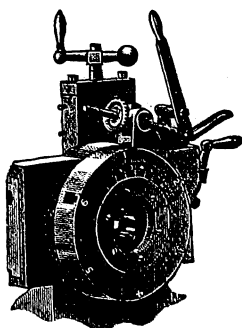
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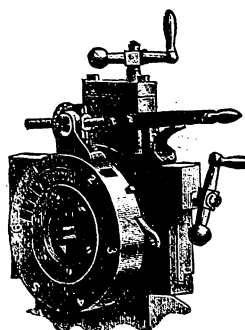
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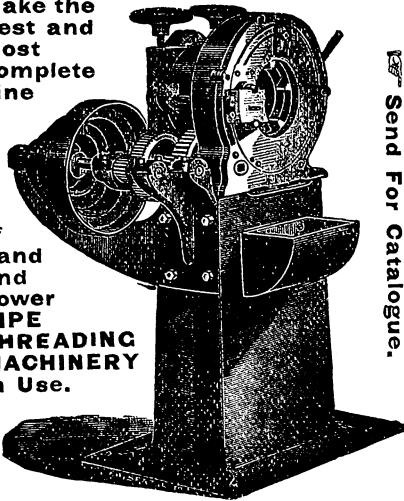
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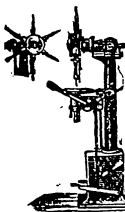
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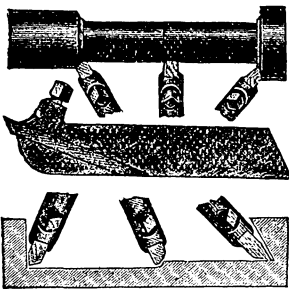
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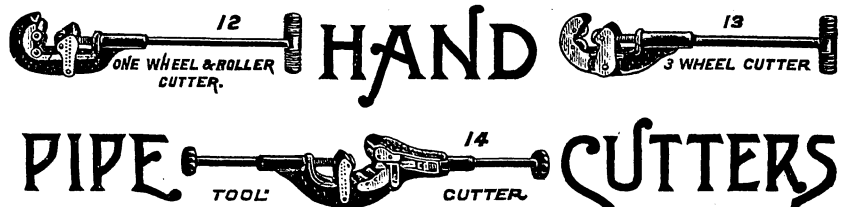
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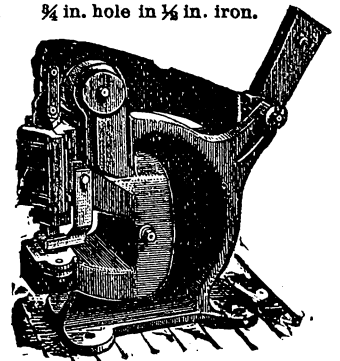
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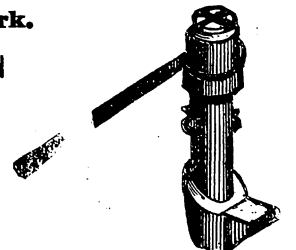
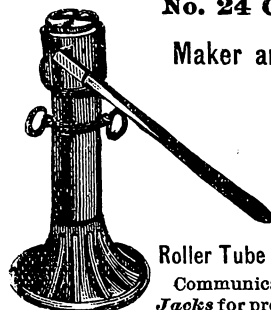


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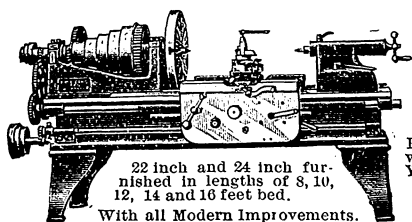
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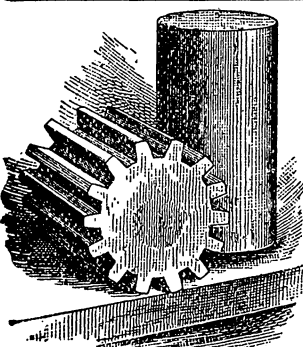
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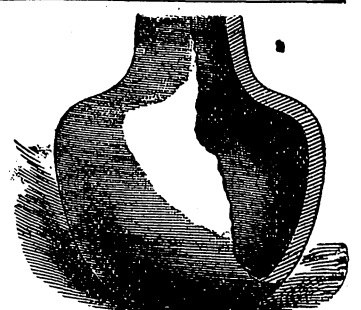
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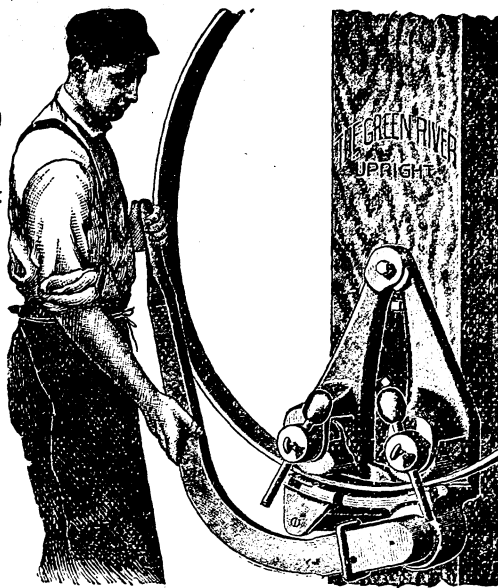
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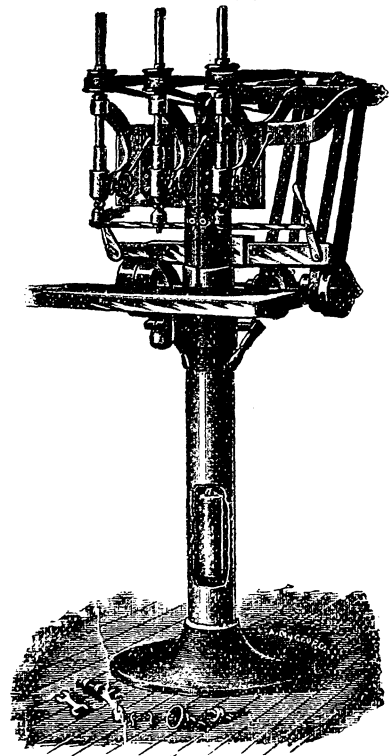
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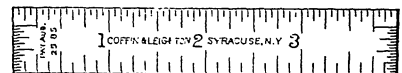
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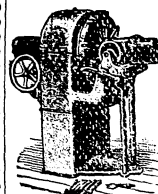
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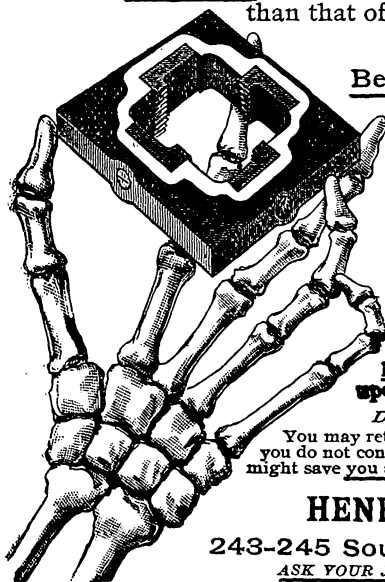
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Before it becomes dull from use it will cut  
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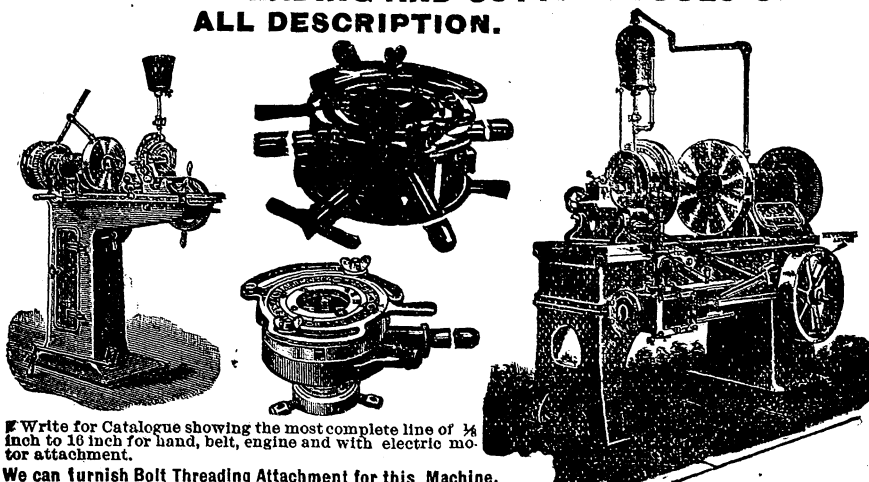
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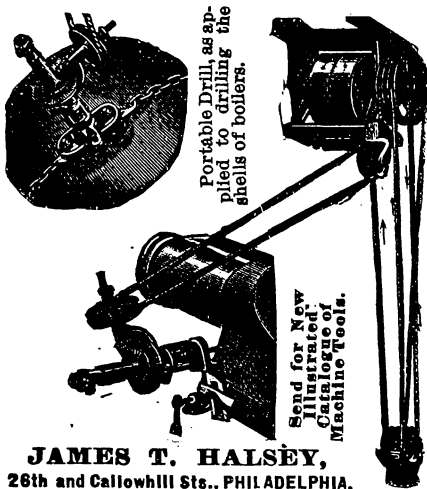
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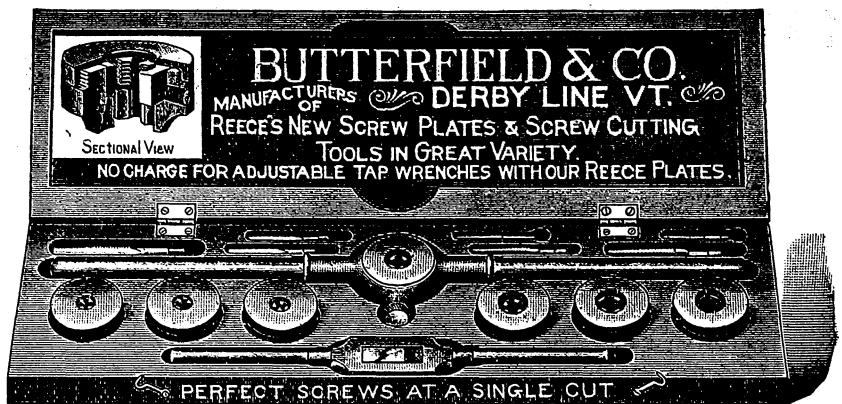
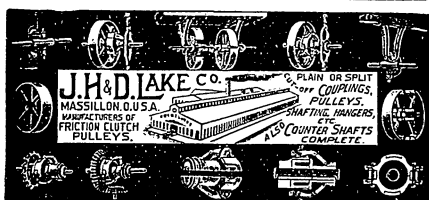
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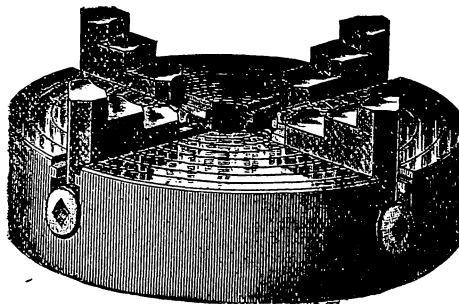
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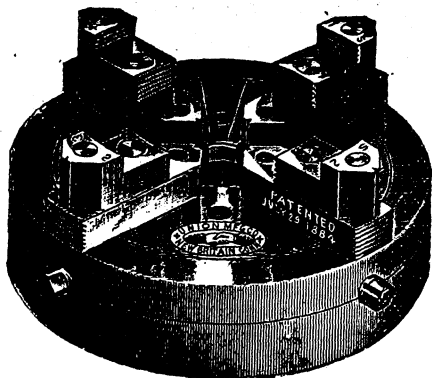
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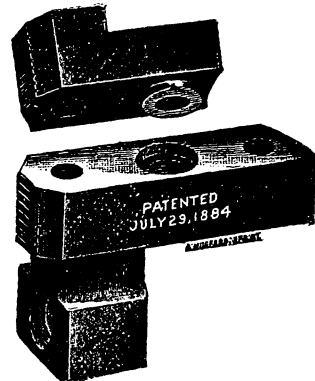
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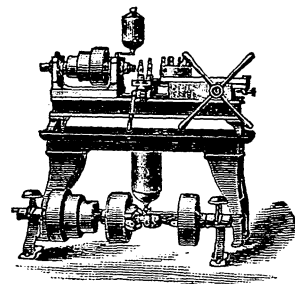
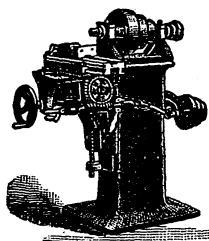


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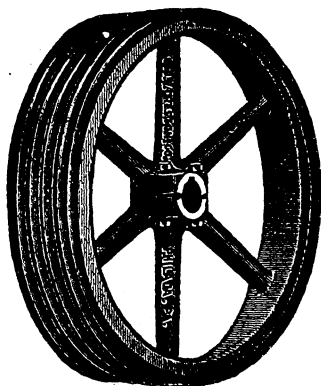
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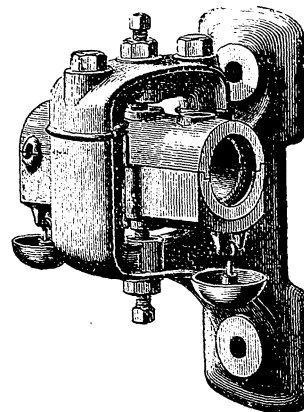
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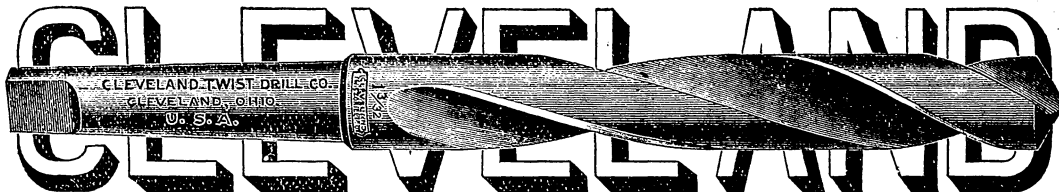
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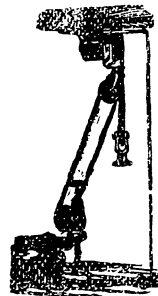
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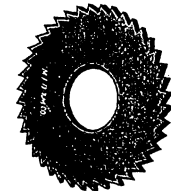
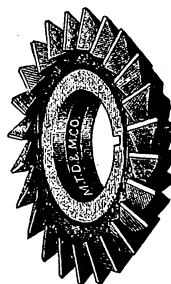
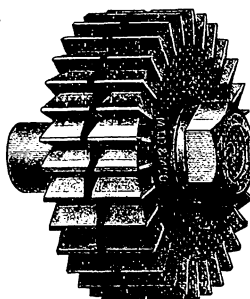
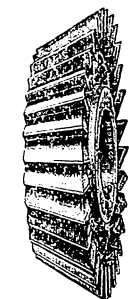
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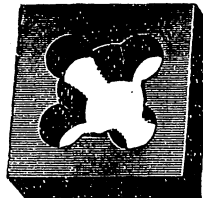


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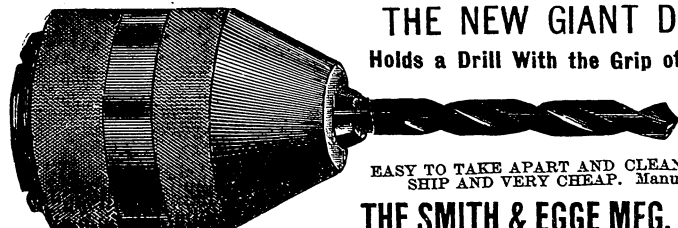
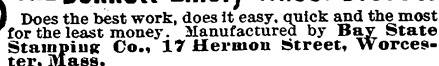
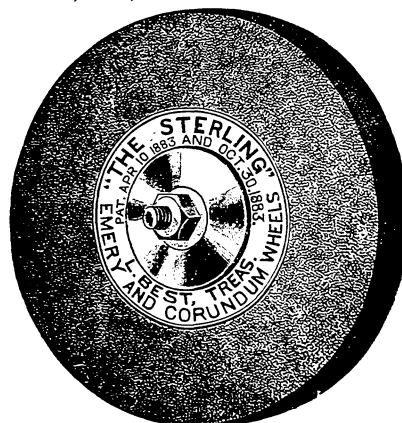
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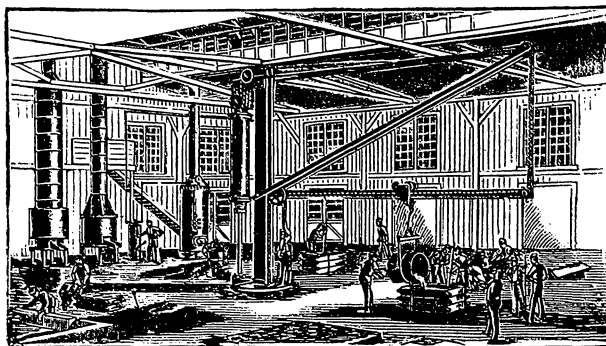


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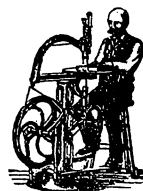
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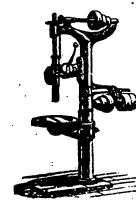
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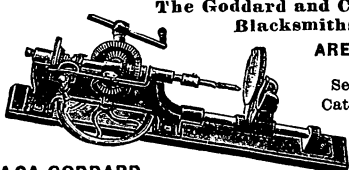
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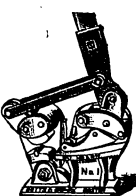
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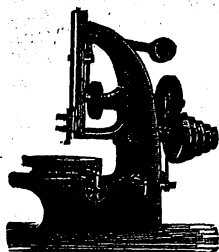
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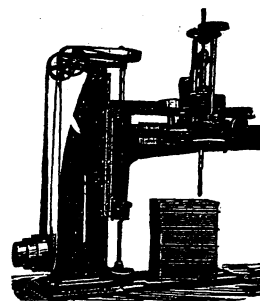
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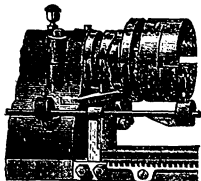
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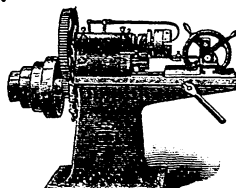
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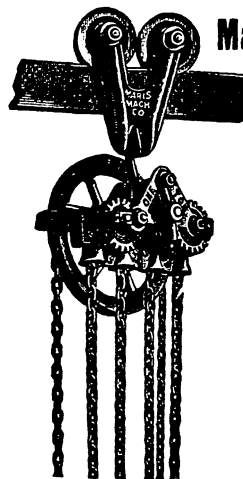
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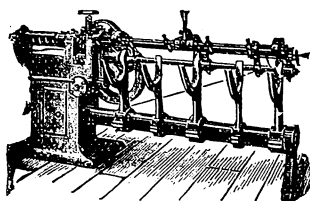
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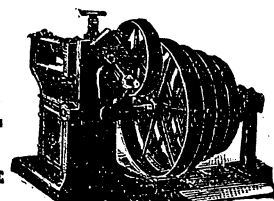
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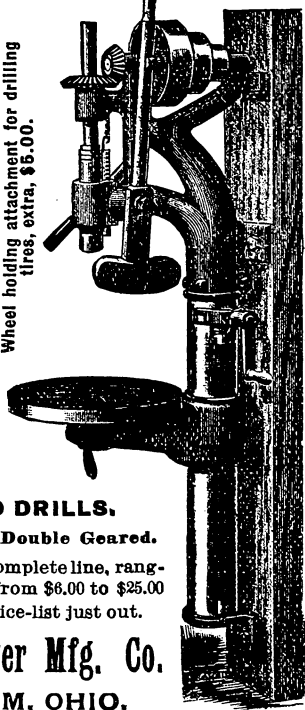
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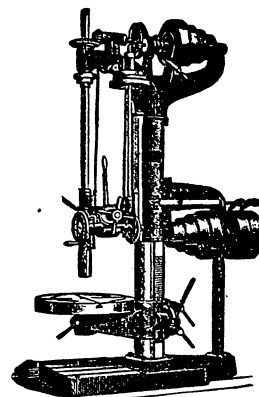
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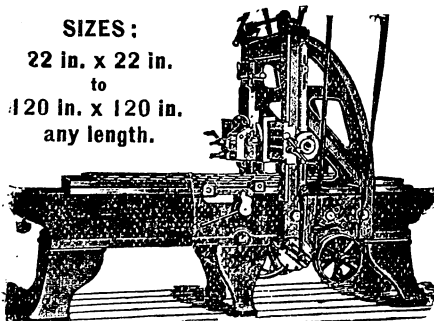
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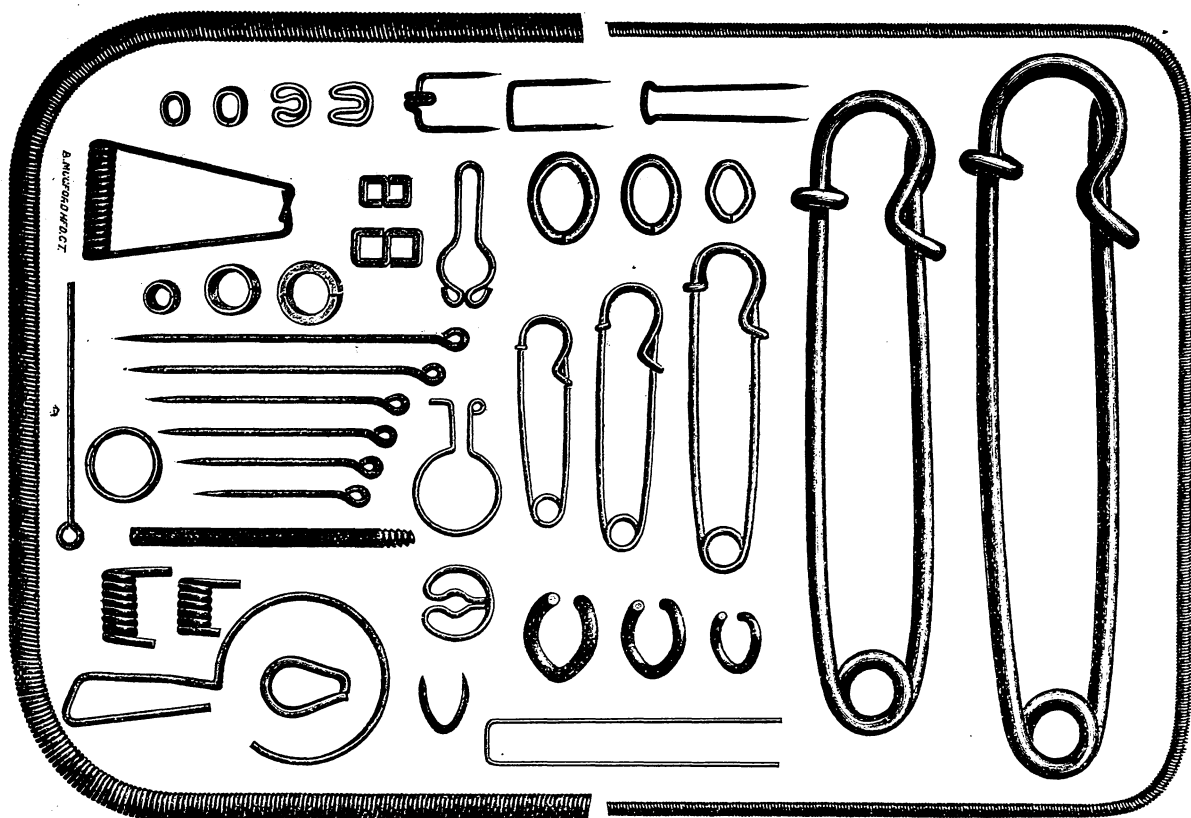
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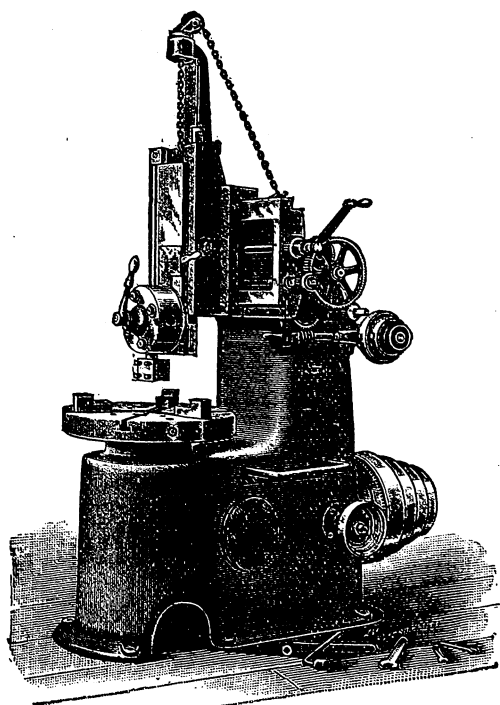
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New York City Rolling Mill, foot of East 23d street. Modern plant, consisting of three high 18 in. Muck Mill and 10 in. Finishing Mill, with Rolls to make  $\frac{3}{4}$  in. to 2 in. round or square,  $\frac{3}{4}$  in. to 3 in. flat, thick or thin sizes; two heating and one bushing or puddling furnace. Excellent location. Large trade in Merchant Bar and H. S. Iron, cheap scrap. Particulars and satisfactory reasons for disposing by personal interview only.

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in new and second-hand machinery. We are about to move into our new factory and wish to dispose of the following tools:

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36 in. x 36 in. x 16 ft. Lathe & Morse Planer.  
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36 in. Brainard Gear Cutter for Spur and Bevel.  
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22 in. Star Tool Co. Chucking Lathe.  
37½ in. x 10 ft. Back Geared Polishing Lathe.  
16 in. x 6 ft. Polishing Lathe.  
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5 in. Cutting-off Machine, Nicholson & Waterman.  
24 in. Hendey Shaper.  
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The above will be sold at a fraction of their real value if bid for at once.

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Nos. 1, 2, 3 and 4 Horizontal Boring Machines.  
40 in., 50 in., and 76 in. Horizontal Boring Machines.  
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Bolt and Nut Facing Machine.

These at cut figures for the next 30 days.

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1000 feet of Iron Railing or Fence suitable for bridge, lawn or cemetery.

50 large cast Iron Lamp Posts. Photograph on application.

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We offer at very attractive prices a lot of machinery from

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Engine Lathes,  
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A large stock of second-hand machine tools of all kinds. Write for detailed description and prices.

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One large Hydraulic Press. Address, stating capacity and lowest cash price.

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## 100 CITIES AND TOWNS WANTING INDUSTRIES

Is the title of a pamphlet issued by the Illinois Central R. R. Co. If you are thinking of making a change in location and are not well informed as to the advantages of locating either in the West or South, write for a copy. If you want in a nutshell the

### SALIENT POINTS OF OVER 100 PLACES

on the line of the Illinois Central and Yazoo & Mississippi Valley Railroads, giving the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries desired, etc., apply to the undersigned. Our line is in the shape of the figure "7" and runs from Sioux Falls, S. D., and Sioux City, Ia., to New Orleans, passing through South Dakota, Iowa, Minnesota, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and has

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used in manufacturing, together with populous sections which are large consumers of the manufactured product. To sound industries which will bear investigation, substantial inducements will be given by many of our places, and they will be welcomed heartily by the different sections traversed by the Illinois Central and Yazoo & Mississippi Valley Railroads. For all information on the subject, address

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With ample facilities for carrying stock, long experience and a location in the center of the hardware district, I desire to represent in New York and surrounding territory, on salary or commission, manufacturer of goods for the hardware trade.

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with index feed to cut notches in the edges of sheet iron disks.

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**SALESMAN**.—By a large manufacturer of steel, iron, copper and wire; must be a young man of good ability and address; applications must include full information, age, experience, references, etc., and will be considered confidential. Address "ELECTRIFY," office of *The Iron Age*, 96-102 Reade St., New York.

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**SALESMAN** calling on carriage manufacturers and jobbing or large retail carriage hardware trade West, South and East to handle line of excellent selling staple specialties, side line (commission), or resident responsible representatives in Chicago, Philadelphia, St. Louis, New York, San Francisco and Boston who can reach tributary trade and do justice. "SALESMAN," Lock Box 1086, Philadelphia.

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*Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.*

**A MIDDLE-AGED MAN** having an experience of 15 years as office manager for a large hardware manufacturer seeks a similar position, or that of bookkeeper, cashier or correspondent; salary moderate; excellent references. Address "RESPONSIBILITY," office of *The Iron Age*, 96-102 Reade St., New York.

**A FOREMAN** of machine shop, by thorough practical machinist, 34 years of age, with eight years' experience in handling men; considered a hustler; can give good reference. Address "MACHINE SHOP," office of *The Iron Age*, 96-102 Reade St., New York.

**YOUNG MAN** with knowledge of retail and thoroughly experienced in the wholesale hardware business, four years with the largest firm of its kind in the West, desires a position, salesman preferred; or to act as a manufacturer's agent in Chicago or other large Western city; unquestionable references. Box 32, office of *The Iron Age*, 59 Dearborn St., Chicago.

**A FOREMAN** of foundry. Address "PUSHER," Box 426, office of *The Iron Age*, 96-102 Reade St., New York.

**TWO YOUNG MEN** with good experience in hardware manufacturing would like chance to take charge of hardware and plumbing business in a good town; can furnish some capital; we are hustlers and will work for success; can furnish best of references. Address "HUSTLERS," No. 426, office of *The Iron Age*, 96-102 Reade St., New York.

**A SUPERINTENDENT**, by a man of large experience in designing and directing the construction of fine interchangeable machinery, specialties, machine tools, printing and shoe machinery; am patentee of new lathe which I wish to dispose of or would arrange for the manufacture of same under royalty. Address "INVENTOR," office of *The Iron Age*, 146 Franklin St., Boston, Mass.

**AN EXPERIENCED** business man, late cashier and bookkeeper for a large iron and steel manufacturing company in East Pennsylvania, desires suitable position with tin plate manufacturing company with privilege of investing in the business, if mutually satisfactory. "TIN PLATE," office of *The Iron Age*, 96-102 Reade St., New York.

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**BY A MECHANICAL ENGINEER** and Draftsman; have had ten years' experience in steam, hot water, hot air and sheet iron work; can handle skilled and unskilled labor to good advantage; have no objection to locality; strictly temperate and reliable. J. P. LISK, 636 Monroe St., Brooklyn, N. Y.

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**BY A THOROUGH** hardware traveling Salesman; 20 years' active experience in store and on the road in all lines of general hardware, cutlery, guns, etc., also make cutlery and builders' hardware specialties. Address "EXPERIENCE," office of *The Iron Age*, 99 Dearborn St., Chicago.

**EXPERIENCED** office man wants position with hardware house; eighteen years' experience with two first-class wholesale and jobbing houses; thoroughly competent to take charge of correspondence, costs, quotations, price-lists, assist buyer; hard worker; highest references; moderate salary; distance no object. Address "ALAMO," office of *The Iron Age*, 96-102 Reade St., New York.

**A YOUNG MAN**, for several years connected with the engineering department of one of Philadelphia's largest manufacturing concerns, would like to take the agency for Philadelphia and vicinity for the sale on commission of the product of an iron works or other manufacturing business; the advertiser has the advantage of an intimate personal acquaintance with the prominent iron firms, shipbuilders and electric railway people. Address "AGENCY," office of *The Iron Age*, 220 So. 4th St., Philadelphia.

**A MEMBER** of the American Society of Mechanical Engineers, at present manager and general superintendent of a large machine shop and foundry, desires to change his location; any manufacturer, of machinery or steam plants who needs a man of solid experience ought to address "EARLE," office of *The Iron Age*, 22-24 Pickering Building, Cincinnati, O.

**AS ROLLER** on small mill; by a man of 15 years' experience; is thoroughly posted in all kinds of guide mill work; is also experienced in structural shape iron; is strictly temperate; can give best references. "ROLLER," No. 419, office of *The Iron Age*, 96-102 Reade St., N. Y.

**BY experienced** mechanic as superintendent of manufactory making locks and builders' hardware a specialty; 15 years' experience as superintendent; understands the business in all its branches; can handle men and material economically. Address "M. C.," No. 419, office of *The Iron Age*, 96-102 Reade St., N. Y.

**A foreman** of iron foundry by a thorough practical foundryman with six years' experience as foreman; can handle men and material in an economical manner. Address "H. J.," No. 419, office of *The Iron Age*, 96-102 Reade St., New York.

**AGENCY WANTED**.—Advertisers desire to represent manufacturer of first-class tool and other steels; have ample facilities for carrying stock and long established trade; would also like one Al side line. Address "J. & H.," Box 419, office of *The Iron Age*, 96-102 Reade St., N. Y.

**TO MANUFACTURERS OF BRASS GOODS**.—A gentleman well posted in the requirements of the plumbing trade desires a position as manager or general agent to represent a first-class house manufacturing fine sanitary specialties; have had 23 years' experience in the manufacture of this line of goods and can furnish considerable business to desirable parties. Address "SPECIALTIES," No. 419, office of *The Iron Age*, 96-102 Reade St., New York City.

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**BY A HARDWAREMAN**; seventeen years' experience in builders' hardware, iron, steel, tinware, etc.; a man of family, good habits and health; wants position to represent on Pacific Coast Eastern manufacturer or wholesaler house; well acquainted with part of the country and trade; willing to travel; responsible and can furnish bond. Address "J. W. A.," care E. S. Adams, office of *The Iron Age*, 812 The Cuyahoga, Cleveland, Ohio.

**TO BRASS FOUNDERS**.—A thoroughly practical foreman molder, with large and varied experience, well up in melting and mixing of metals to suit every description of work; for years at the Delaware Iron Works, New York City; electrical work and copper castings a specialty; can give best of references; machinery jobbing shop, preferred. Address "H. P. A.," Citizens National Bank, Yonkers, N. Y.

**SELLING AGENCY WANTED**, for blast furnace and iron and steel works products, by a gentleman having extensive acquaintance among railroads, foundries and shops. Address "AGENT," No. 111, office of *The Iron Age*, 96-102 Reade St., New York.

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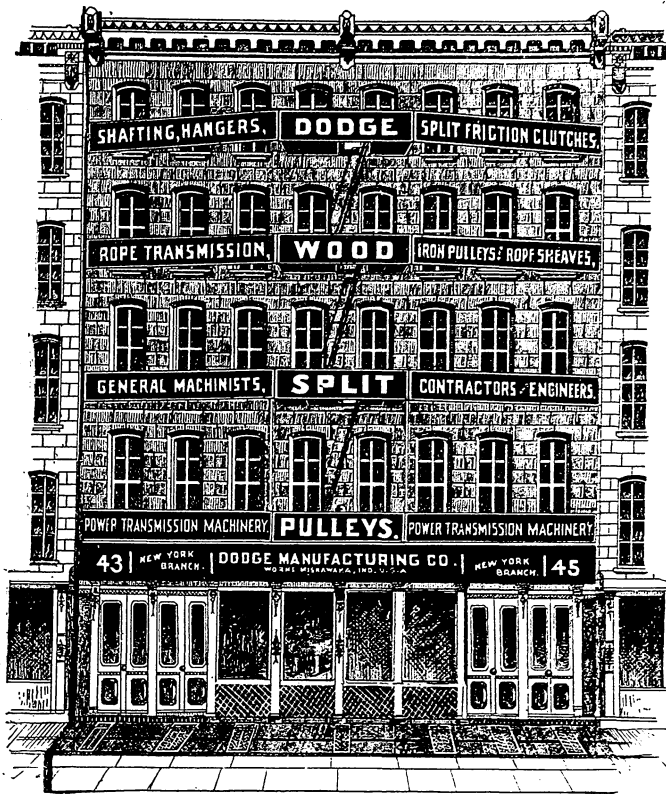
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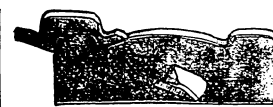
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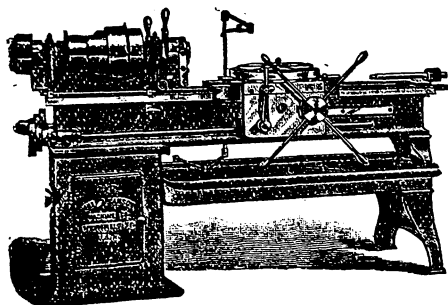
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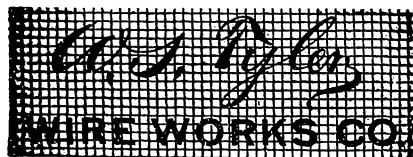
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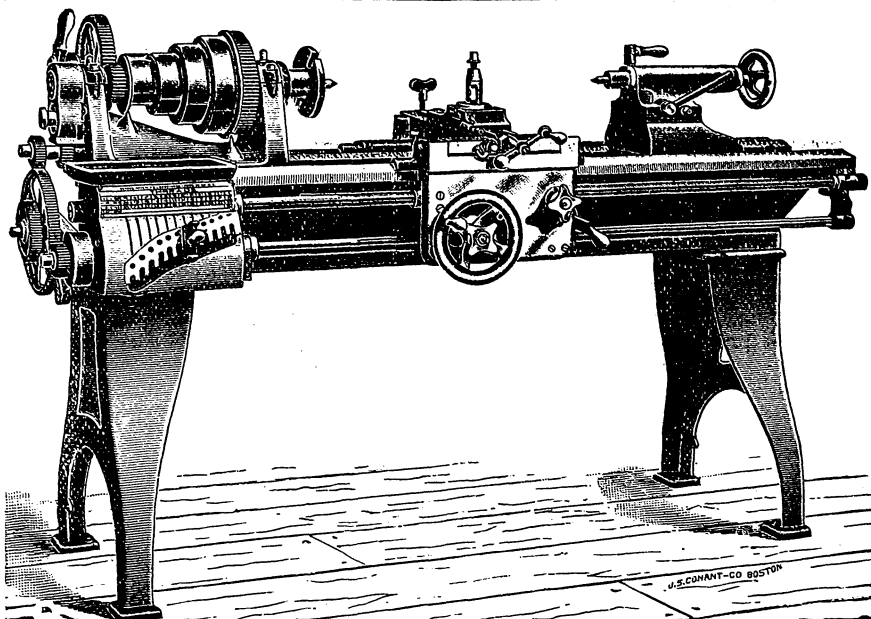
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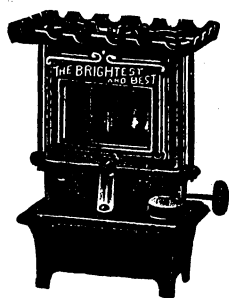
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This lathe cuts 12 different screws, from 6 to 20, without changing the gears, and feed changes from 36 to 120 cuts per inch without change. This cut shows a 14-inch x 6-foot Lathe. It has hollow spindle, 1-inch. Has compound or elevating rest, as preferred, or the double carriage rise and fall rest. Also taper attachment if desired. The carriage reverses for screw cutting without the use of the countershaft, from the lever at the end of carriage, allowing the spindle to run in one continuous direction. In stock for immediate delivery, 14-inch, 16-inch and 18-inch 20-inch and 30-inch in the works. Send for descriptive catalogue.

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the **STEARNS**  
has led all the  
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Bicycles captured these  
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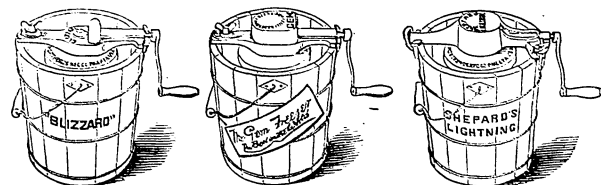
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MADE IN TWO SIZES  
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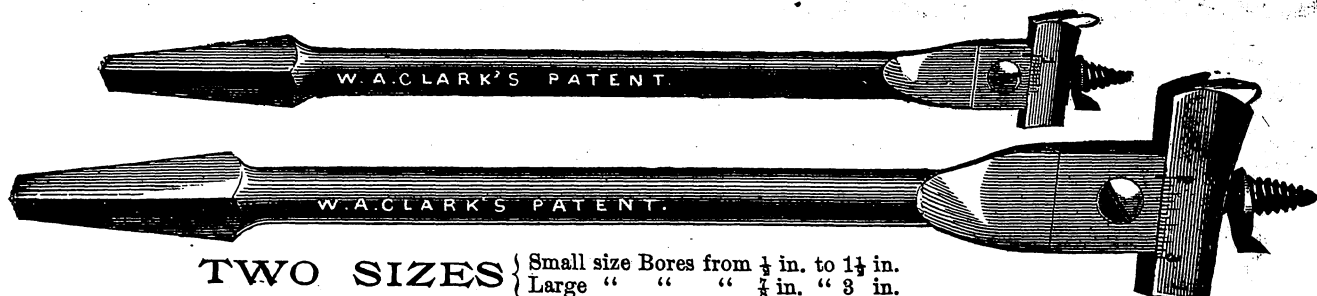
We want enterprising agents of good standing and solicit correspondence.

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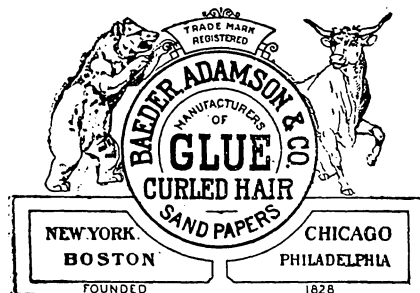
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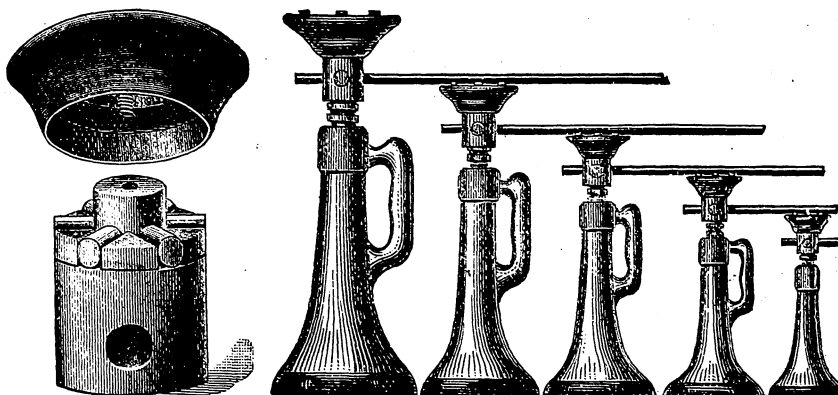
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Single  
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Handle and Blade Formed in one piece.

Always Clean. Indestructible.

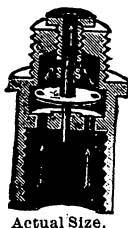
No Rivets to Wear Loose.

No Wooden Handle to Shrink, Swell, Loosen,  
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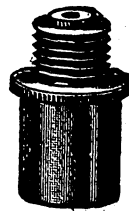


Actual Size.

## "Economist" Gas Governor

GAS BILLS REDUCED 25 PER CENT.

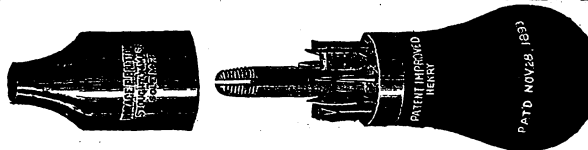
Retails for 30 cents and gives large profit to agent. We place our governors on trial for 30 days and guarantee perfect satisfaction. Agents wanted in all cities and towns where gas is used. Write for circular and agents' price to



**The New York Gas Saving Co.,**

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## PATENT IMPROVED



**HENRY COMBINATION WRENCH,**

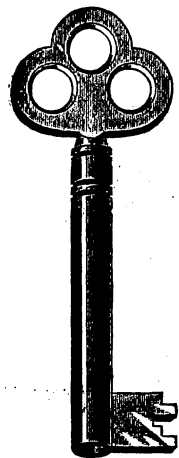
Containing five Brad-Awls, one Chisel, Screw Driver, Diamond Point Awl, Marking Awl, Counter Sink, Tack Puller and Reamer. Send for Circular of full description and illustration. If you would have the Best, get the Patent Improved. Sent post-paid on receipt of \$1.00.

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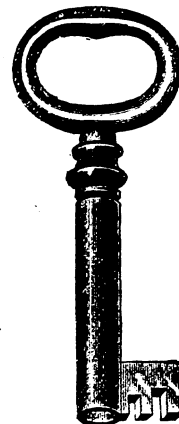
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IT IS ALWAYS RELIABLE,

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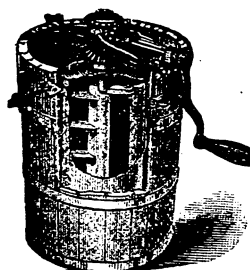
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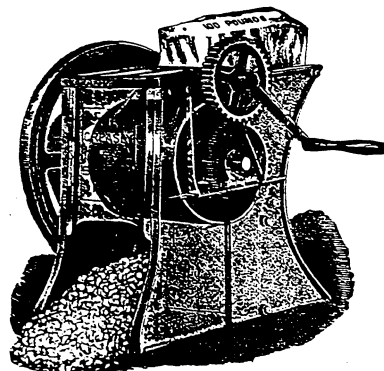
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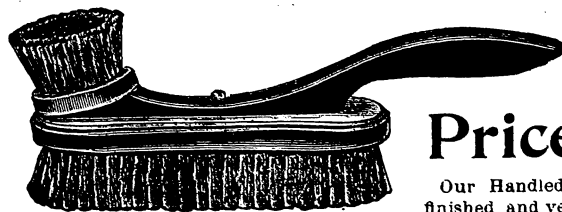
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HAND OR POWER. 7 Sizes.



No. 1 (Hand or Power) Machine.

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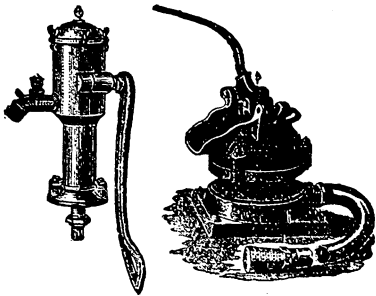
A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries,

Fig. 209.

Fig. 381.

Fig. 145.



or wherever it is desired to raise a large quantity of water by  
hand power.

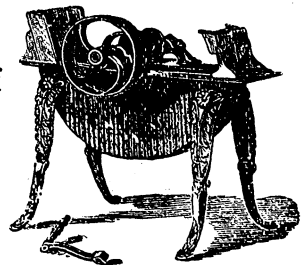
The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

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from 3,000 to 4,500 gallons per hour.

These pumps are simple, durable and low priced.  
Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

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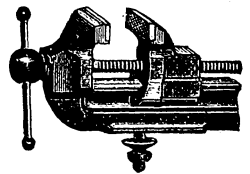
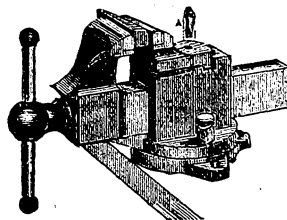
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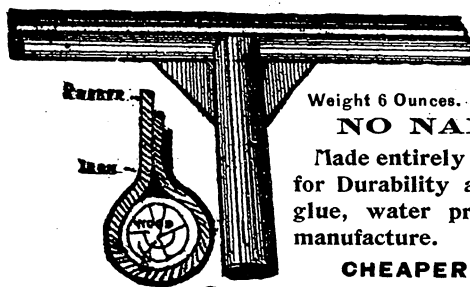
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**Nonpareil Window Cleaner.**

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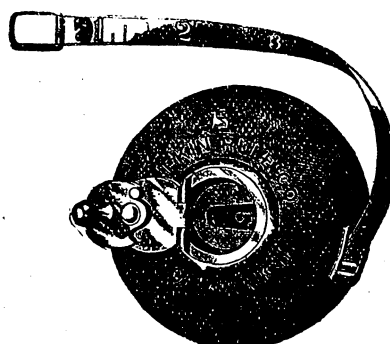
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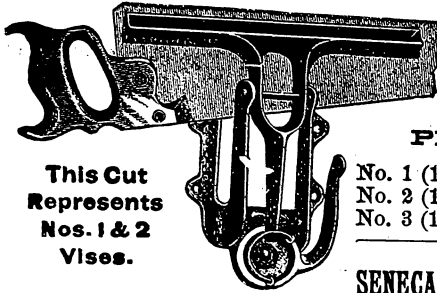
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## WENTWORTH'S PATENT NOISELESS SAW VISES, WITH RUBBER CUSHIONED JAWS.



This Cut  
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Prevent all vibration and render Saw Filing noiseless.  
Will make no more noise than Filing on a Solid Piece of Iron.

Have a Larger Sale than All Other Kinds Combined.

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| No. 1 (11 inch Jaws), | \$15.00  |
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LONGEST JAWS, HEAVIEST AND  
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Steel Letters and Figures.  
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NICKLE, Silver and Bronze Metallic  
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We make a specialty of the Hardware Trade.  
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### HARDWARE SHELF BOXES

Made of Wood.  
No screws or  
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WITH GROUND AND GRADUATED VIAL.

4-6 and 8 inch.



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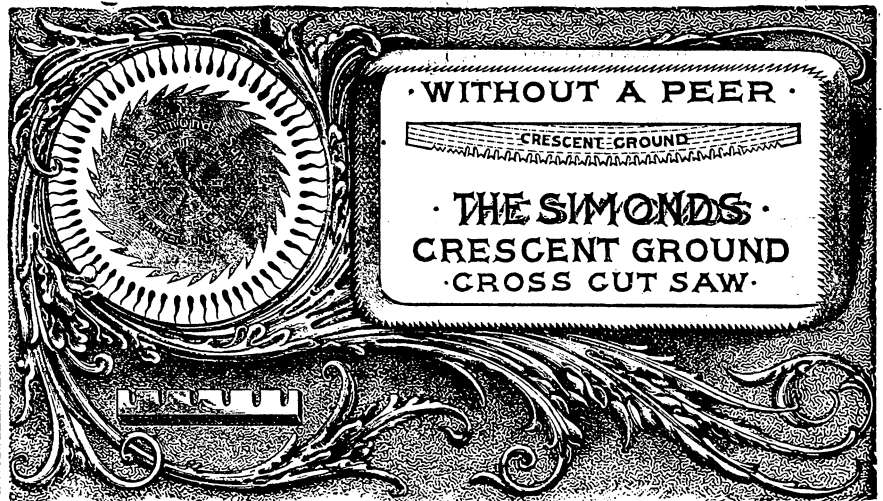
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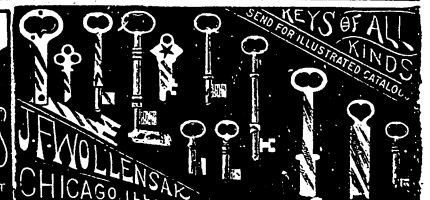
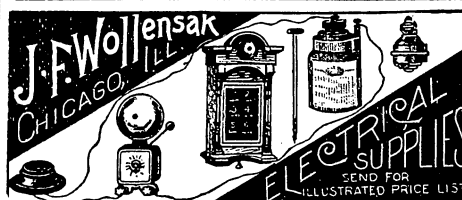
## The Taintor Positive Saw Set.

Mechanics are now inquiring for this tool, and Hardware Dealers  
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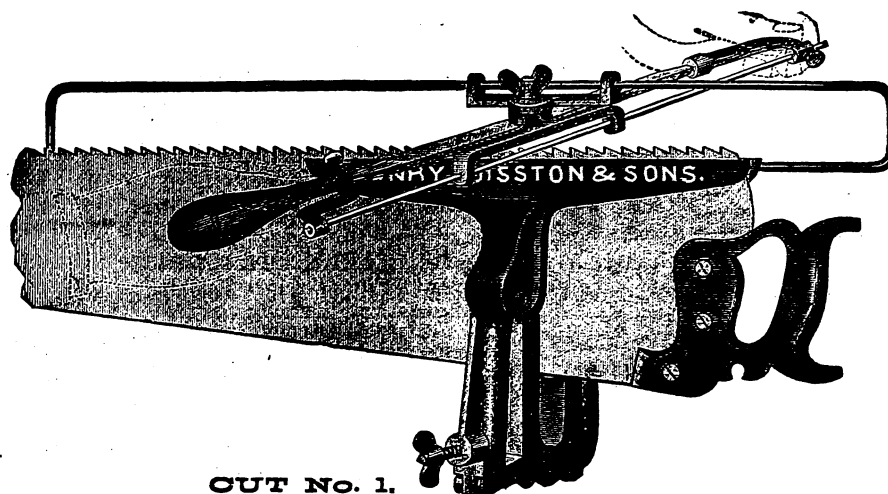
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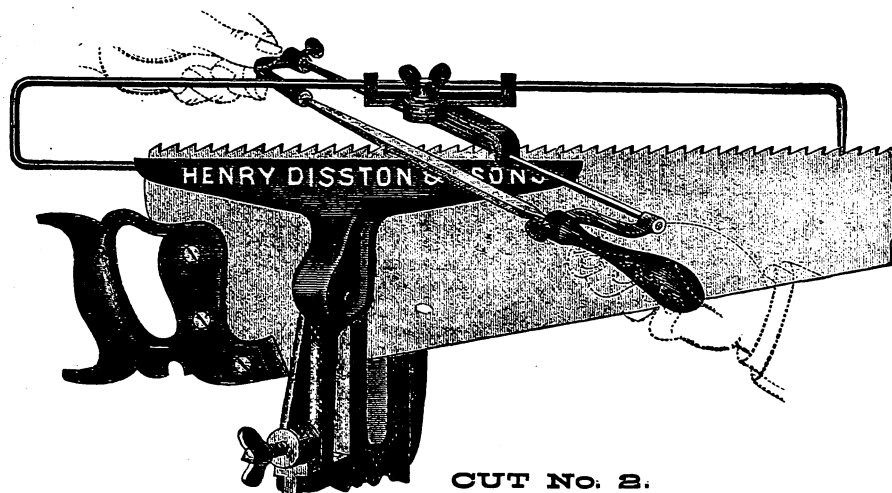
# DISSTON'S Improved Saw Clamp AND FILING GUIDE.

ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART  
OF SAW FILING TO FILE A SAW CORRECTLY.



CUT No. 1.

Cut No. 1 shows a saw and the attachment in proper position for filing the first side; and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT No. 2.


To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.


This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

Write for price including No. 3 Clamp, Filing Guide, File and Handle complete: Packed one in a wooden box.

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## WARRANTED FILES AND RASPS.

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NEW YORK.

FACTORY  
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WESTERN OFFICE.  
CHICAGO.

## THE FILES THAT LEAD THEM ALL

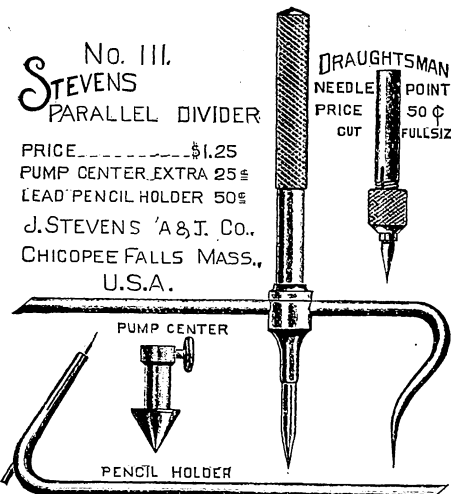
THE BEST EQUIPPED FILE WORKS IN THE WORLD.

“The fact that the Arcade File Works alone use the improved File Machinery recently invented by Alfred Weed, and the even heat of natural gas, enables them to produce files that cut faster and wear longer than any on the market.”

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No. III.  
**STEVENS**  
PARALLEL DIVIDER

PRICE ..... \$1.25  
PUMP CENTER EXTRA 25¢  
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J. STEVENS & SONS, CO.,  
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PRICE 50¢  
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ONE HUNDRED  
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**Finest** Mechanical  
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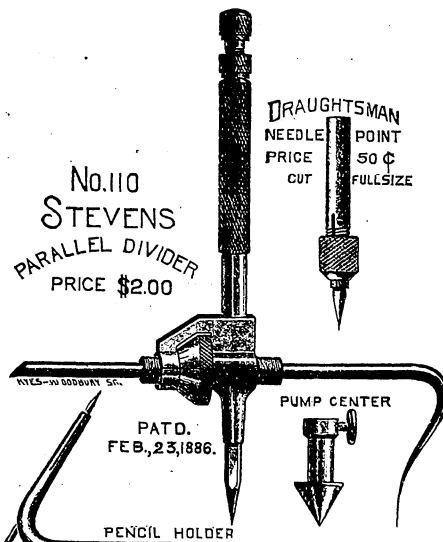
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**STEVENS**  
PARALLEL DIVIDER  
PRICE \$2.00



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FEB. 23, 1886.

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Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly true, of hardest temper, and never to come off or “settle.” Horn of tough *untampered steel*, never to break or bend. *Only Anvil made in the United States fully warranted as above.*

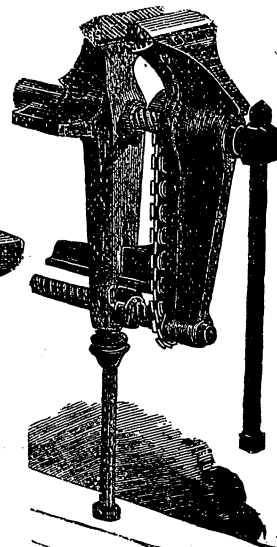
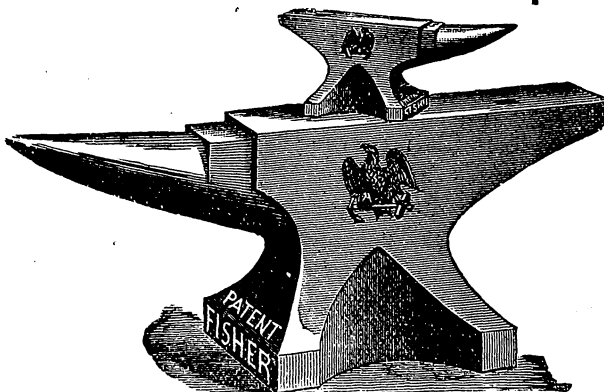
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IS FULLY WARRANTED STRONGER THAN ANY OTHER LEG VISE, AND ALWAYS PARALLEL. Is the best Vise for Machine Shops and Blacksmiths, and for all heavy work. ACCURATE AND DURABLE. Send for Circular.

ESTABLISHED 1843.  
MORE THAN 200 DIFFERENT PATTERNS.

None Genuine without our Trade-Mark.

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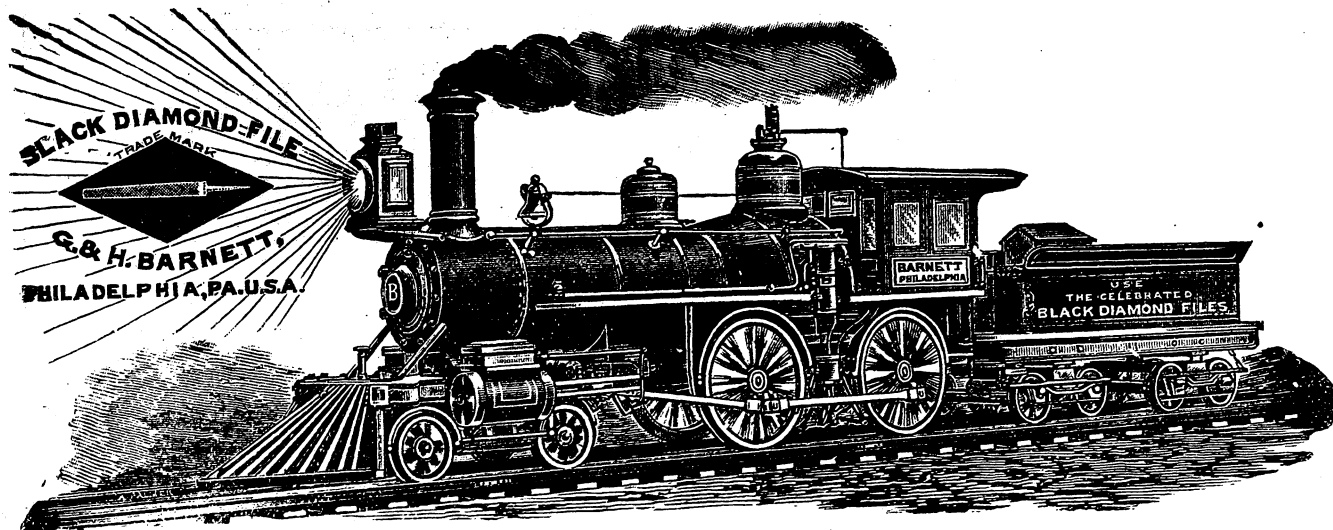


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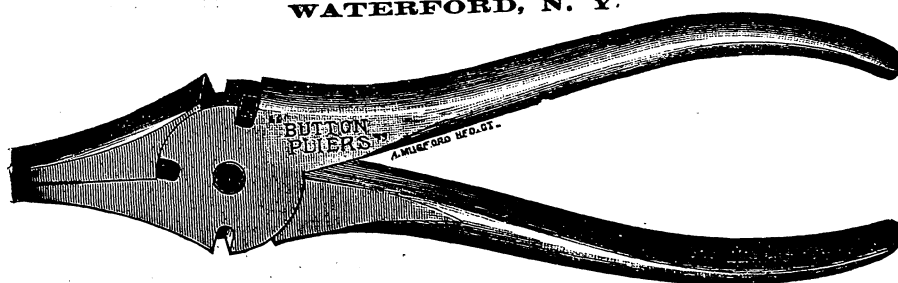
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VARIETIES FILES  
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Manufacturers of  
**BUTTON'S**



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Manufacture and keep in stock a full line of FILES and RASPS only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

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Send for Illustrated Catalogue.

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Have established and maintained their reputation, for superiority,  
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A Complete Line of

**Bit Braces**

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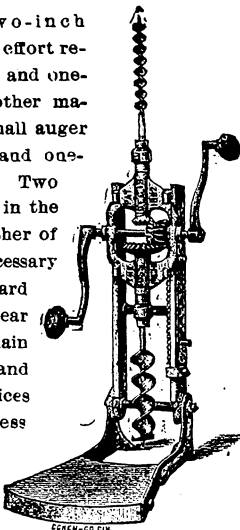
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## The Boss 2-speed Boring Machine.

Will operate a two-inch  
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have a speed two and one-  
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Made in all Sizes.



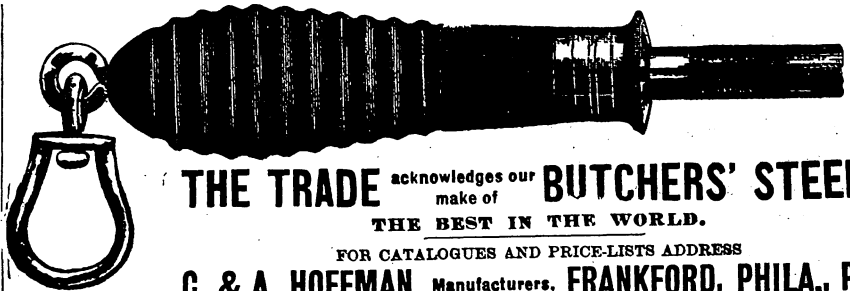
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Made with cutters of best steel.

ACME CUTTING NIPPER.  
Jaws of Choicest Tool Steel, dove-  
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That is why it is always economy to buy

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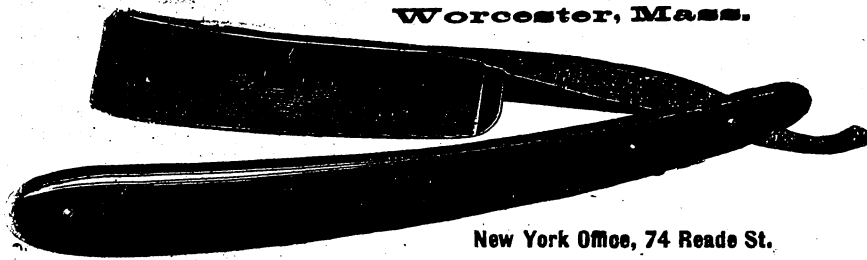
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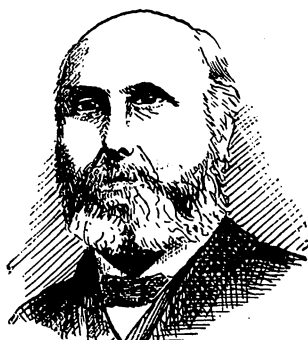
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CAUTION.—Buyers wanting the standard Buck Tools will see  
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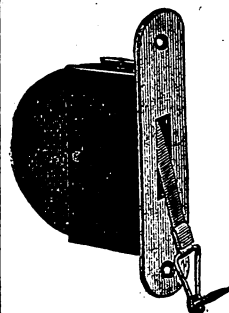
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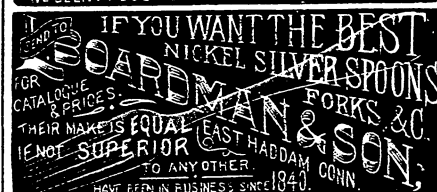
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**AMERICAN TOOL COMPANY,**

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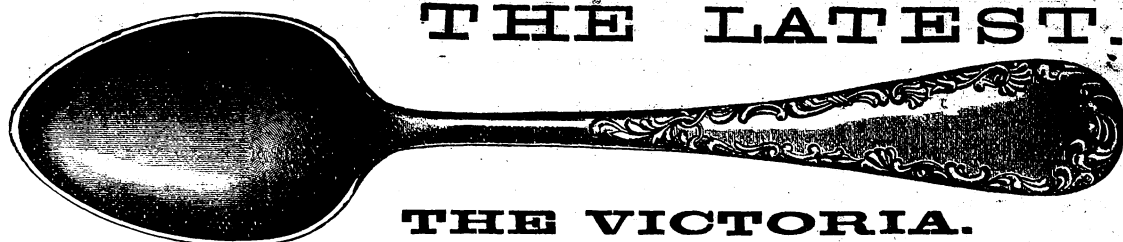
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We have a full line of above, which is the neatest pattern ever presented to the trade, and it is stamped



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WINDSOR. PLAIN HANDLE.



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Combination Sets, 6 Knives and 6 Forks, in Satin Lined Case, at same price as Knives.

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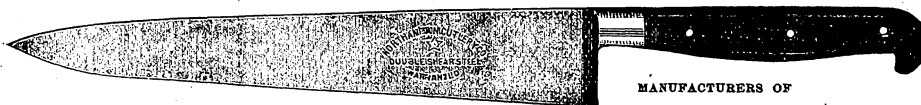
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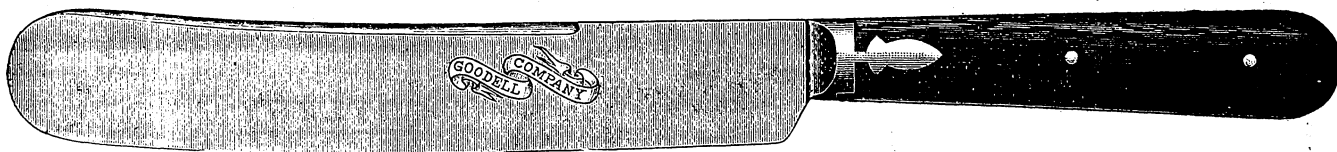


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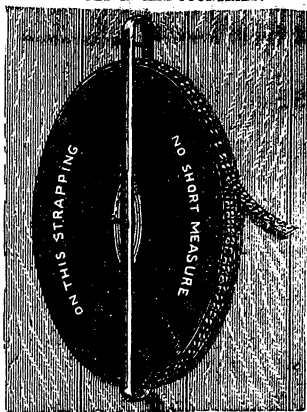
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All Goods put up in this style to be genuine must bear the name of the **CARY MANUFACTURING CO.**, stamped on each reel.

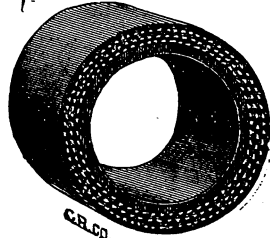
**CARY MANUFACTURING CO., 5 to 9 Elm St., NEW YORK.**



This is a fac-simile of the label on my **VULCAN TOOL CO.** brand of **HATCHETS**; a brand for which I have a regular trade in some sections, but to those who have not "caught on"—dealers who are handling an outside brand—I offer a limited quantity at a very low price. Inquiries for price solicited.

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**Who Has Not Had Bad Hose ?**

Who has not lost time, patience, money, by attempting settlement for such goods ?

**THE CAUSE** in nine cases out of ten is the lapped seam.  
**THE REMEDY** is in buying our

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Made in All Sizes and Kinds of Garden, Engine, Steam, Fire, Brewers' Cotton Hose, &c.

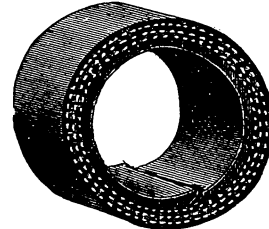
Order a Sample Bale of our Seamless-Tube Hose—Best in the World, costs no more than ordinary lapped-seam hose. The different colors, Red, White, Black, Green and Yellow, make a fine window or sidewalk attraction.

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of the Mechanical Rubber Co.,  
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Makers of Mechanical Rubber Goods, Clothing, Druggists' Sundries, Specialties, Etc.

'OLD LAPPED TUBE



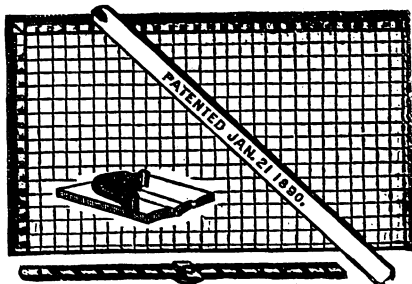
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**COTTON RUBBER-LINED HOSE**

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**Over Two Million Feet**

**GARDEN HOSE**

alone during the past year, distributed throughout the United States, and not a single piece complained of, justifies us in guaranteeing that it will give absolute satisfaction.

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Cuts any Fraction of an inch by Eighths.

Unequaled for accuracy and quick work in cutting square or at any angle. Saves breakages, &c.

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**THE BEST**  
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Sample sent and prices given on application.

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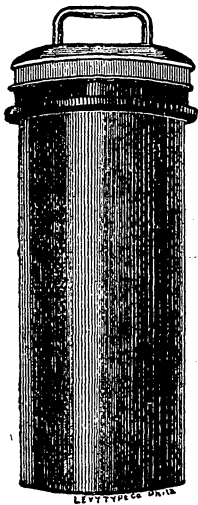
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ICE CREAM  
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At Bottom Prices?

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Are Reliable.

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styles and  
sizes.

List prices  
from \$6.00  
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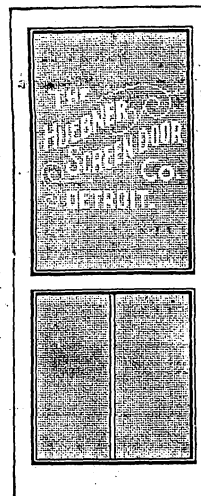
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supply of moist-  
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For sale by David Williams, 96-102 Reade St. N. Y.



For Sale by  
the  
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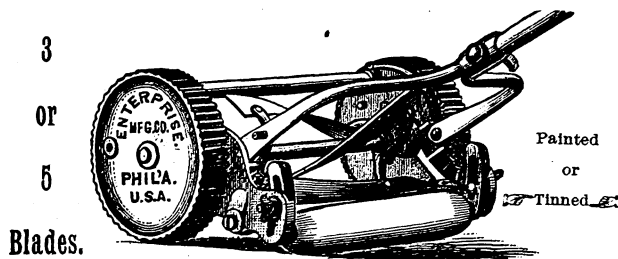
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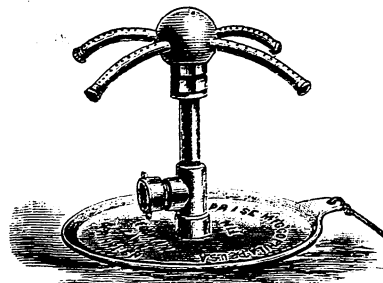
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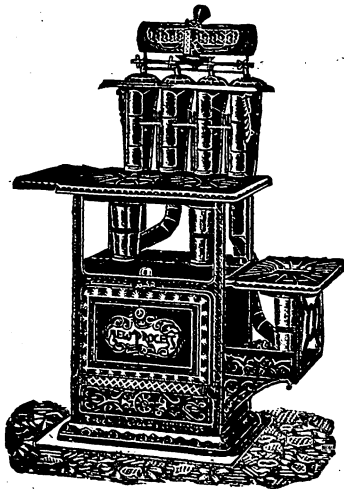
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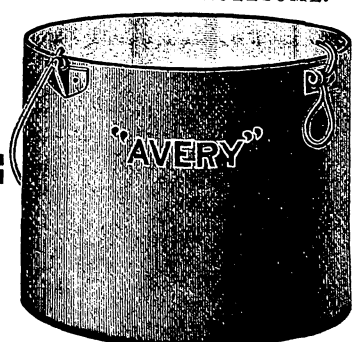
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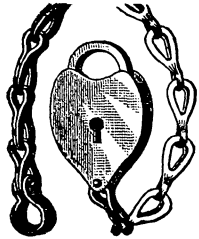
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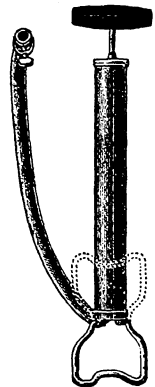
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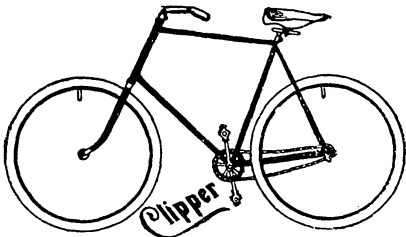
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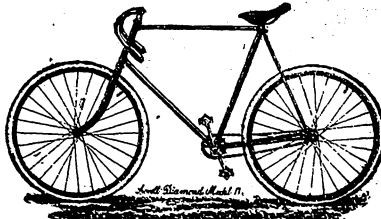
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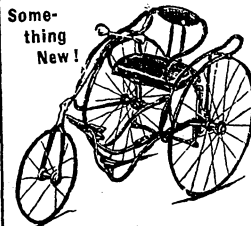
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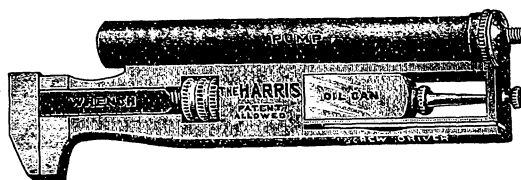
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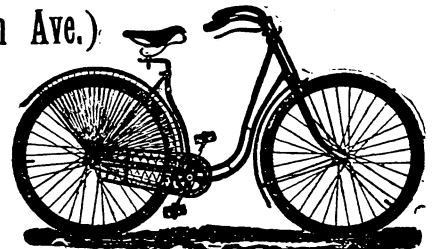
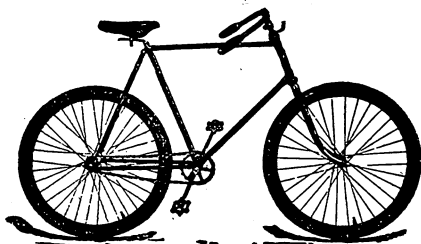
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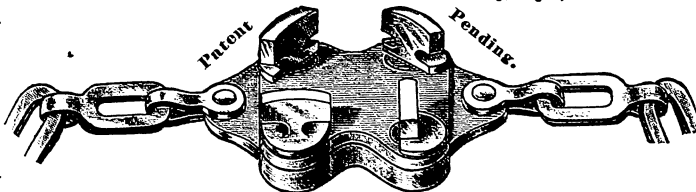
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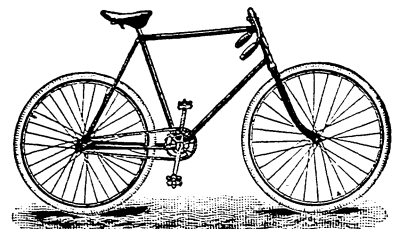
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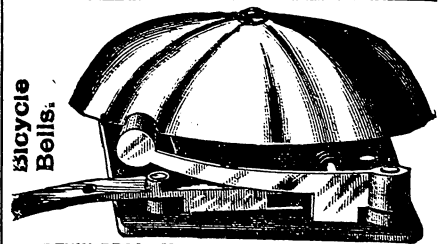


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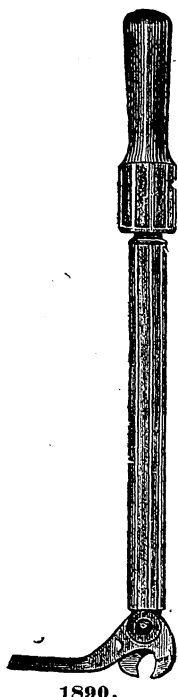
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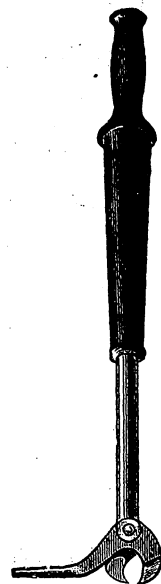
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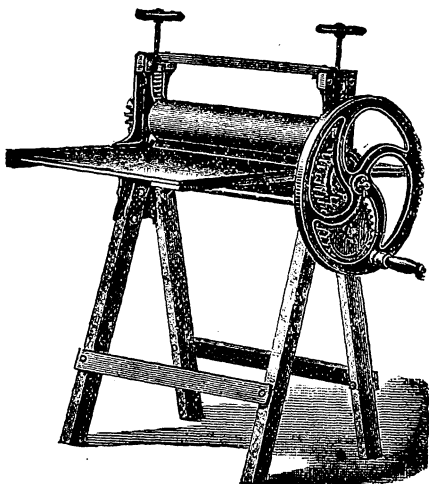
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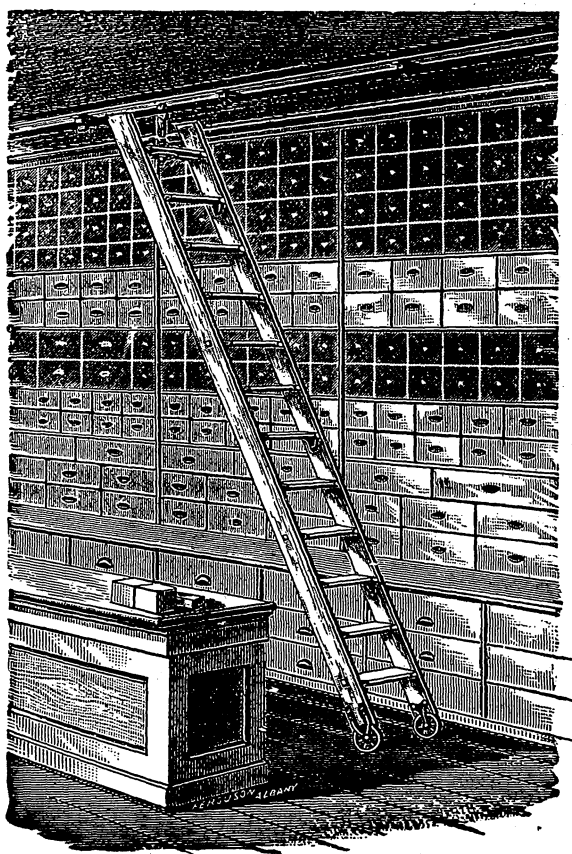


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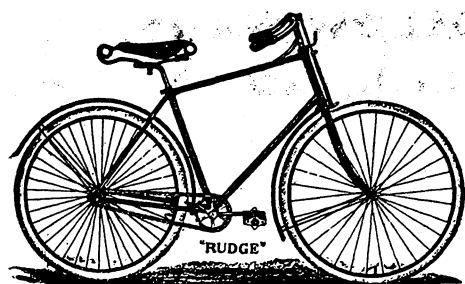


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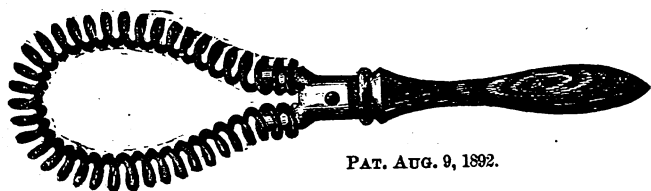
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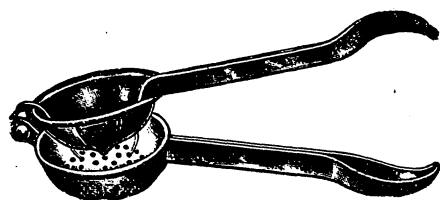
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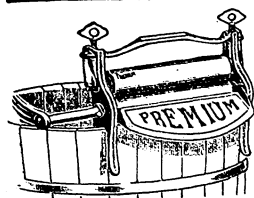
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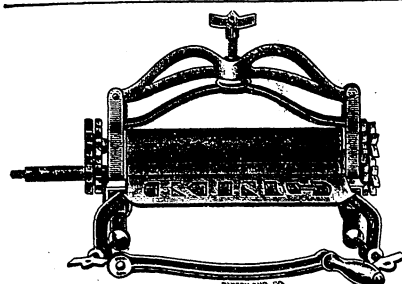
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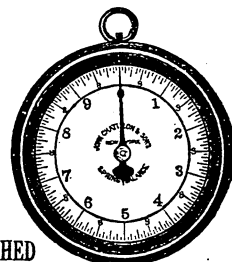
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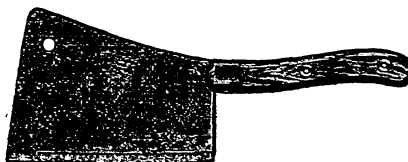
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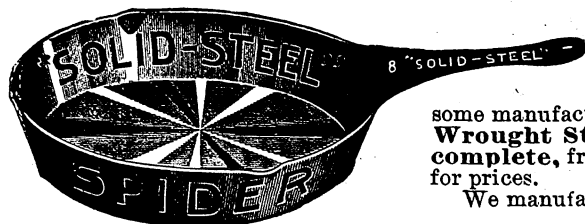


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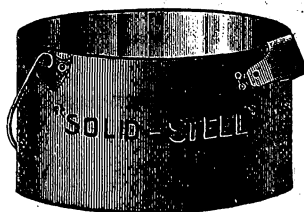
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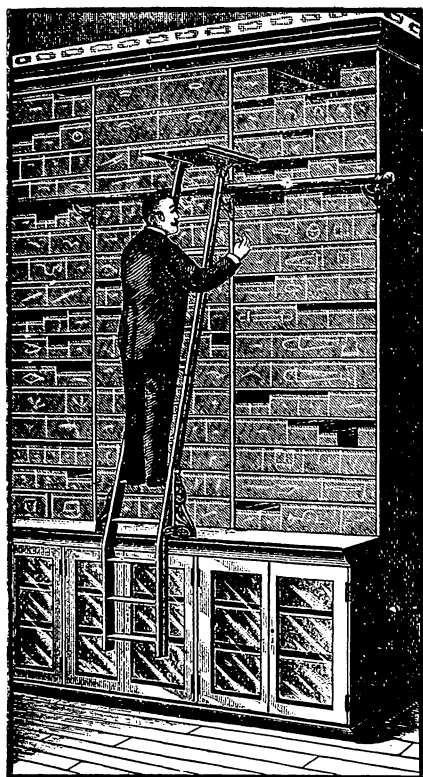
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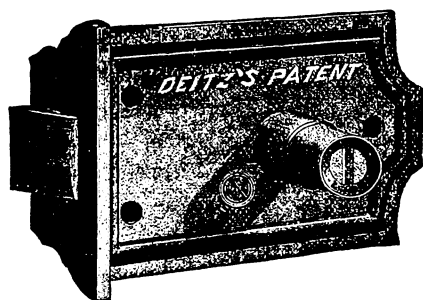
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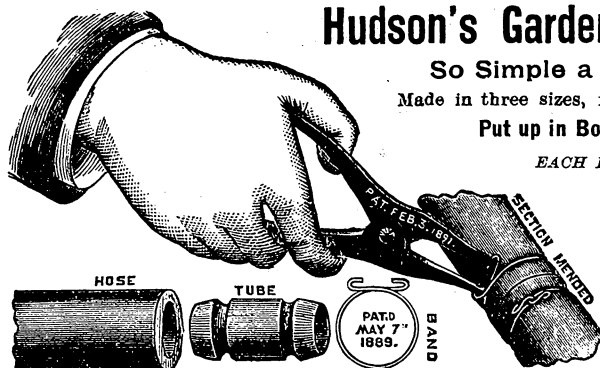
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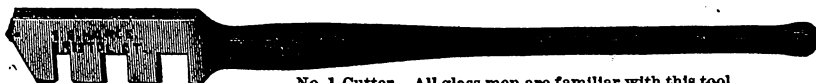
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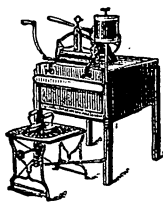
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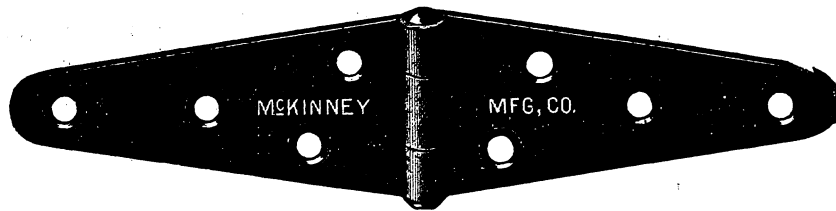


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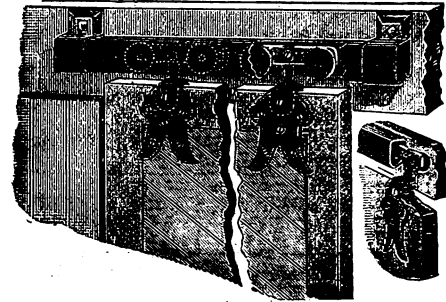
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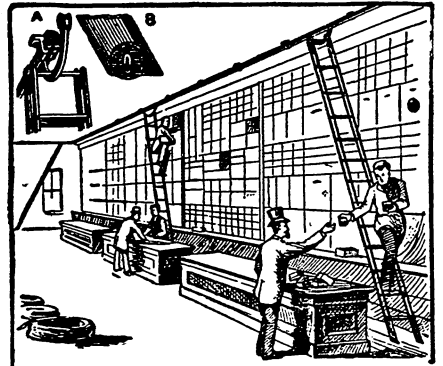
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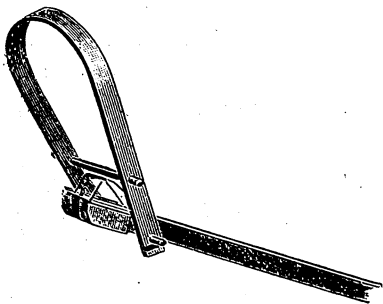
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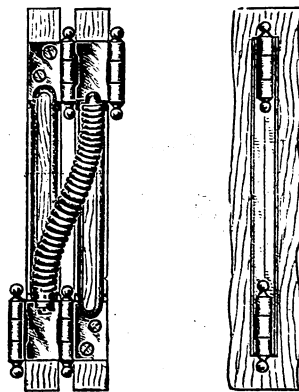
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**THE BISHOP POKES** are the best, as they are made from good material, are very strong, and have all the latest improvements up to date. Shun other pokes said to be just as good, for they are not. For names of Bishop Pokes we refer to price-list in *Iron Age*. They are for sale by nearly every jobber of hardware in the U. S.

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Highest Award, World's  
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..... Our "Duplex"  
*Wrought Butts* have no  
equal for strength and  
beauty of Finish.

Made in *Wrought Steel*  
and *Bronze*—all sizes.

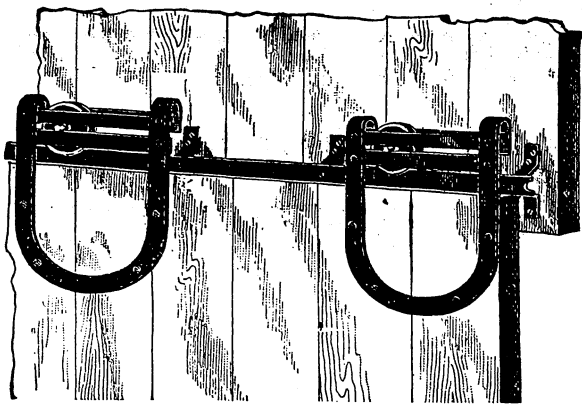
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Factories, READING, PA.

## Phillips Screens

FOR DOORS AND WINDOWS, ARE WELL  
MADE, FROM GOOD MATERIALS BY

**A. J. Phillips & Co., Fenton, Mich.**



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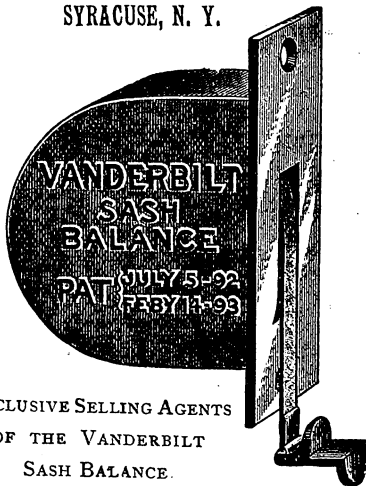
The first Anti-friction Steel Door Hanger placed upon the market and to-day stands as the original and best. Sold in all the States of the Union, as well as abroad. Also Lane's Noiseless Steel Parlor Door Hanger, using Single Steel Track, a great success.

Lane's Pat. Self-measuring Faucet, measuring liquids as drawn.  
Swift's Coffee Mills in great variety.

Manufactured by **LANE BROS.**, Poughkeepsie, N. Y.

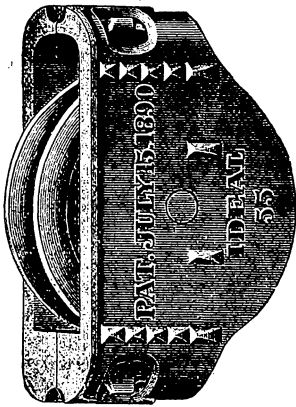
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**E. C. STEARNS & CO.,**  
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EXCLUSIVE SELLING AGENTS  
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SASH BALANCE.

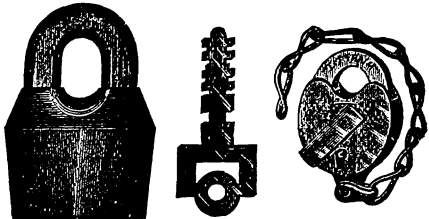
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Adapted for auger socket or machine made mortise. Applied without chisel or screws, quickly and a perfect fit in every case. The only all round Sash Pulley made. Sample free. Price on application.

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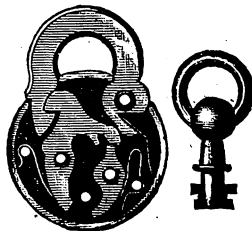
ESTABLISHED 1879.  
**KEYSTONE LOCK WORKS,**  
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Originators, designers, patentees and manufacturers of all the leading popular styles of **PADLOCKS**, Key-Locking Scandinavian with our patent Inter-Locking Tumblers; the only reliable lock of this style ever made. **SELF-LOCKING** Scandinavian of the highest type of perfection. Dust Proof Railroad, Freight Car and Switch Padlocks. Brass, Bronze, Steel and Malleable Iron Padlocks for all purposes and in all finishes. 131 different kinds. Write for our new 100-page catalogue.

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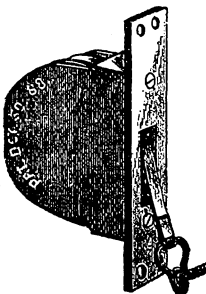
*Eight Tumblers, Key Turning Both Ways.*

Sizes,  $\frac{1}{4}$  inch to  $2\frac{1}{4}$  inches, of cast bronze. Defies competition for quality and price. No steel or iron used, cannot rust, and cannot be picked. Also,  $\frac{1}{2}$  and  $\frac{3}{4}$  inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. The best Railroad Switch and Car Lock in the world.

Adopted by the United States Treasury for bonded warehouses.

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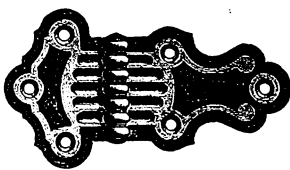
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To buy an inferior article, which your trade condemns, when you can get

## THE CALDWELL SASH BALANCE.

The best material, right principle and care in making and testing have made it the **LEADER** for five years. Write to

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Original and Striking Designs in a Great Variety of Finishes.

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**THE BOMMER PATENT**  
COMPOUND SPIRAL SPRING HINGES

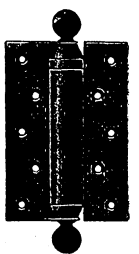
Are Made of

**WROUGHT STEEL,  
BRONZE AND BRASS.**

Also of cast metal in all the finishes known to the trade.

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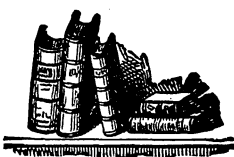
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20 PAGES,

Paper, 25 Cents.

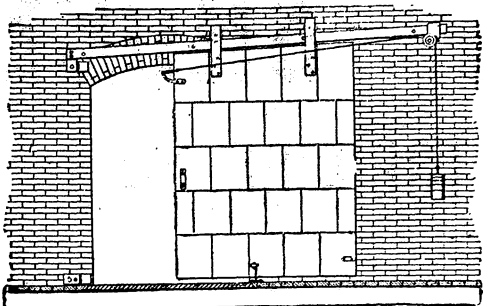
5 x 7 1/4 Inches.



An address to the Institute of Accounts, New York, of which the writer is a member, put in form to assist those in charge of manufacturing accounts. Practical forms are included for a series of order books, examples of foreman's order, form of pay-roll, quarter-time book, job time book, form of summary, charges book, summary of costs, material, labor, cash, expense, manufacturing and improvement acts, store-room, iron foundry, brass foundry. Sent post-paid on receipt of price, by

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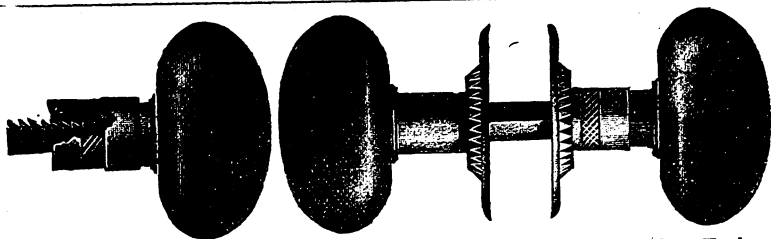


These Fire Door Trimmings have the following advantages over all other devices for a similar purpose:  
**FIRST:** The link is constantly in the opening, whatever position the door may be in, if open at all.  
**SECOND:** One binder, back stop and rope pulley are attached to the track, thus saving two wall bolts, and the expense of drilling for same.  
**THIRD:** The weight is better placed, being in rear of door, and thereby entirely out of the doorway.  
 The saving in labor of attaching and in cost of bolts is at once apparent to the mechanic, while the device is stronger and the protection from fire thereby greatly improved.

Write for Catalogue.

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Sectional cut showing construction of Knob.



Half size cut of knob as applied to door. No side screws or adjusting washers.

Don't you want your stock to represent the latest and most improved up to date Hardware? The Whipple Patent Door Knob is the latest and best Door Knob attachment ever made. Give it a trial. **PERRY & WHIPPLE CO., New Haven, Conn.**  
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Manufacturers,

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WORKS AT MAYWOOD, ILL.

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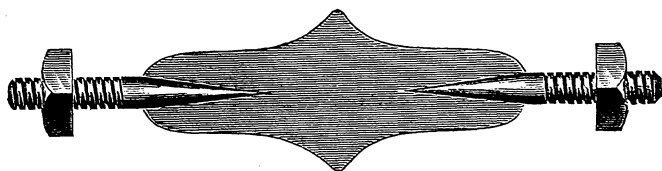
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### CARRIAGE FORGINGS,

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WHEN THE STEEL AND IRON

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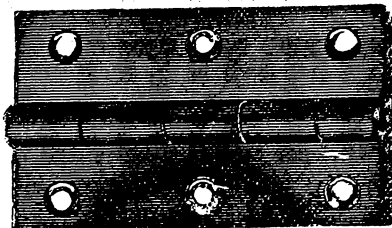
**The Cleveland Block Co.,**

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ARE BETTER IN EVERY WAY.

No waste material. Every ounce of weight in the line of strength. No clumsy outside straps or bolts. As light as wooden blocks and vastly more durable. They wear, but never break. Sheaves interchangeable.

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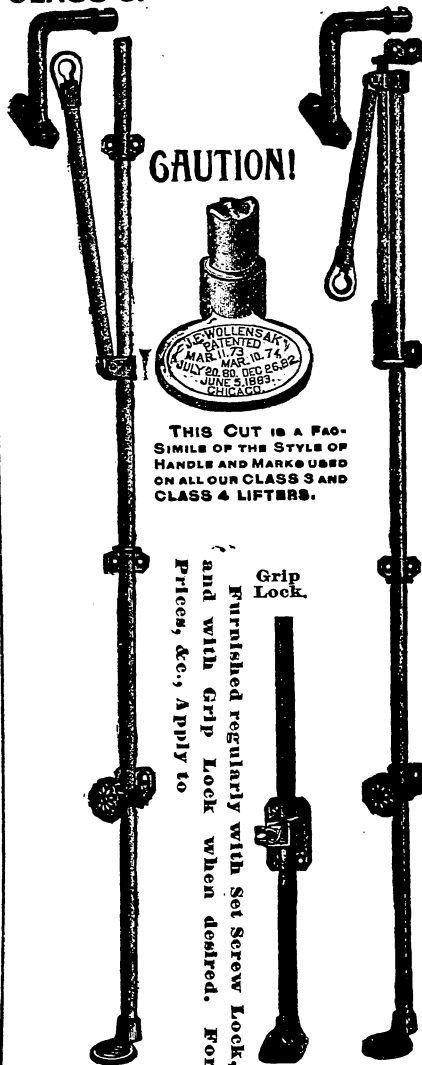
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OLD RELIABLE

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CAUTION!

THIS CUT IS A FAKE-SIMILE OF THE STYLE OF HANDLE AND MARK USED ON ALL OUR CLASS 3 AND CLASS 4 LIFTERS.

Grip Lock.  
 Furnished regularly with Set Screw Lock, and with Grip Lock when desired. For Prices, &c., Apply to

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Estimates cheerfully given. Send for Catalogue

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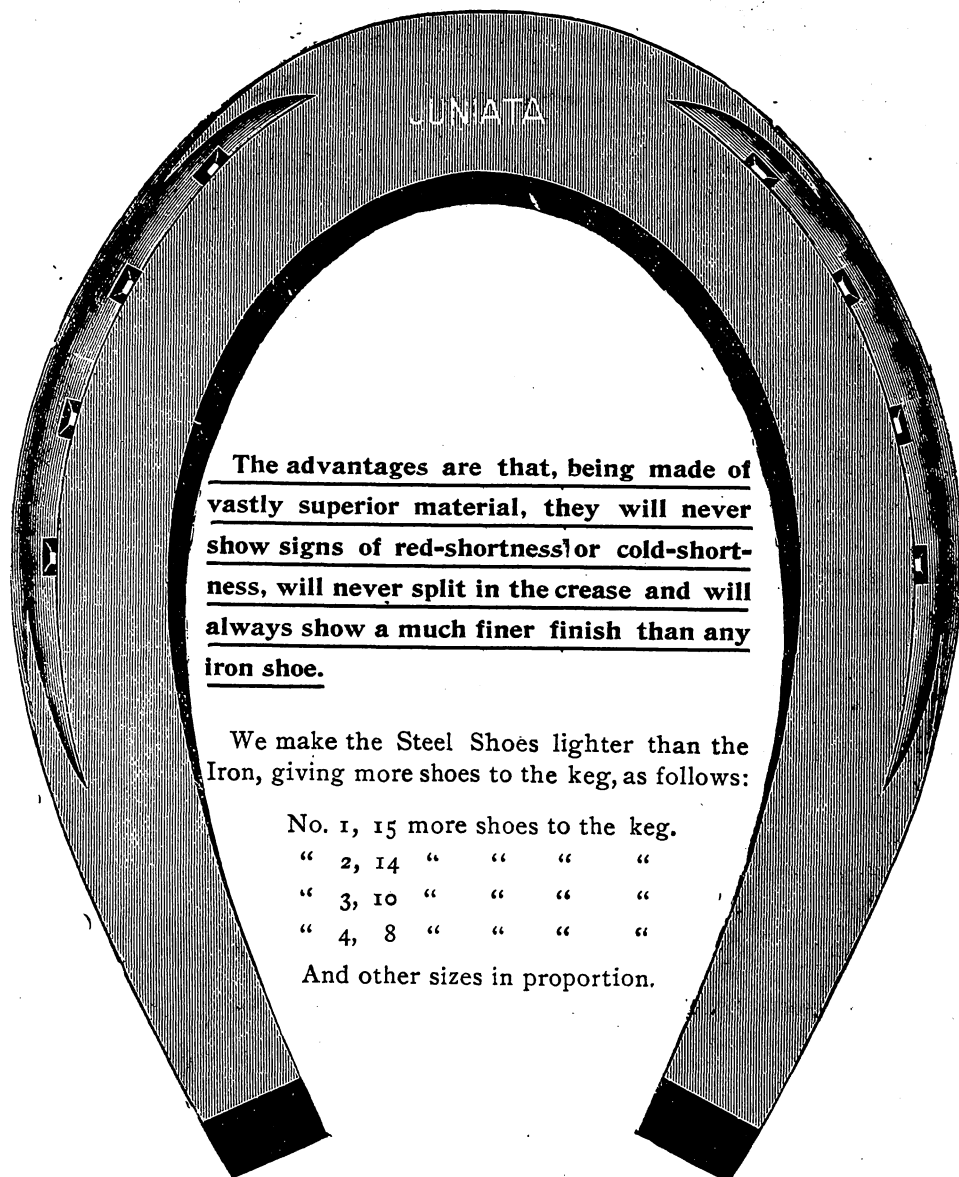
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SHOENBERGER & CO., PITTSBURGH, PA.,

After numerous and costly experiments have succeeded in manufacturing a special quality of soft homogeneous steel, specially adapted to the manufacture of Horse and Mule Shoes, and are now making from this steel Extra Swaged, and Government Pattern Horse and Mule Shoes. They give the best of satisfaction everywhere and we furnish them to the trade at the same prices as the regular iron shoe sold by ourselves and our competitors. We are at present making our Roadster Pattern Horse Shoes out of Iron, but we will make them of Steel also within a short time.



The advantages are that, being made of vastly superior material, they will never show signs of red-shortness or cold-shortness, will never split in the crease and will always show a much finer finish than any iron shoe.

We make the Steel Shoes lighter than the Iron, giving more shoes to the keg, as follows:

No. 1, 15 more shoes to the keg.

" 2, 14 " " " "

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And other sizes in proportion.

No. 2 EXTRA SWAGED FRONT.

We also beg to say that we have introduced improved machinery into our new factory and have doubled our capacity, and are now prepared to furnish the best shoe, either iron or steel, ever offered to the trade.

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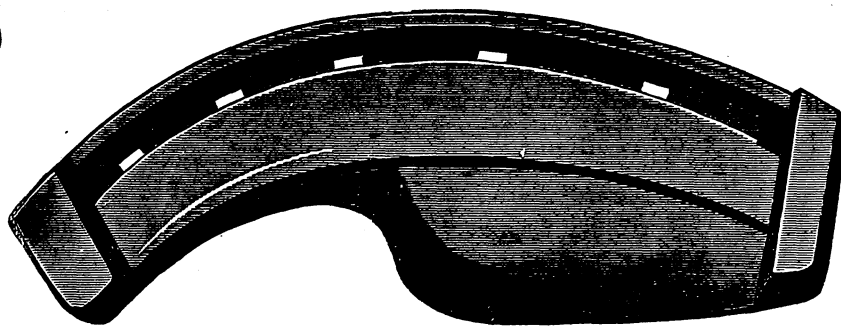
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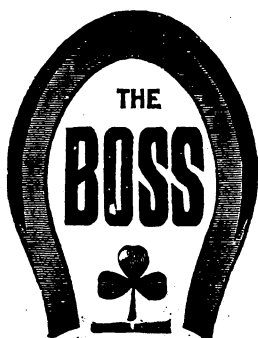
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Made under Deeble's Patent, Aug. 9, 1887.

Our 1891 pattern is a modification of the style we have made for the past four years, giving additional strength to the web.

IT IS JUST RIGHT.



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Superior Quality, Shape and Finish.

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SPECIALTIES:—X L Steel Shoes, Toe Weight Shoes and Goodenough Shoes.

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JUST TRY THEM and YOU will say they excel all others.

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Other "high grade" specialties in Rivets, Spikes, Splice Bars, Track and Machine Bolts, Blanks, Nuts, Stay Bolt Iron, Horse Shoe Iron, Bar Iron, &amp;c.

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Elegant Iron.

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*Light, Medium and Heavy.*

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—AT—  
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In the tests submitted before the judges on awards the Capewell No. 6 was shown to be 17 per cent. tougher than No. 8 of other makes.



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MADE BY  
**THE CAPEWELL HORSE NAIL CO., - - - HARTFORD, CONN.**

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October 28, 1893.

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Very respectfully,  
HERMAN J. HENKE,  
Foreman Blacksmith, World's Columbian Exposition.

The Capewell Patent Corrugated Horse Nail.

Needs No Clinching.

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FOR  
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At the *World's Columbian Exposition* at Chicago. A medal and diploma worded :  
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It allows the use of very small nails."  
There is nothing beyond "supreme excellence," nor is there anything comprised in a horse nail, except the "material from which it is made," "the method of manufacture," and "quality of finished product."  
Putnam nails, by their "elasticity," give slightly to the expansion and contraction of the hoof while the horse is in motion; by their "smoothness," do not enlarge the nail holes in the hoof, while their "supreme excellence," in "holding power in the clinch," enables them to hold the shoe in the hardest service until worn out.  
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Thus it will be seen that the officials of the *World's Columbian Exposition* recognize what qualities go to make up a good horse nail and that only the "Putnam" contains them all.

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Of Best Material and Workmanship.

Send for Price and Illustrated List of

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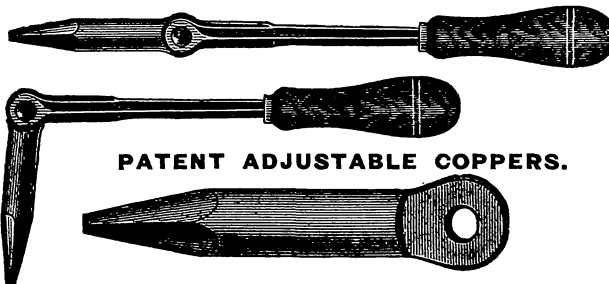
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It is a complete tool in every respect, and can be as easily adjusted at angle while hot as cold. The handle can be used indefinitely, as when the copper is worn out it can be replaced in the same handle, making the iron as good as new at about half the cost of the ordinary soldering iron.



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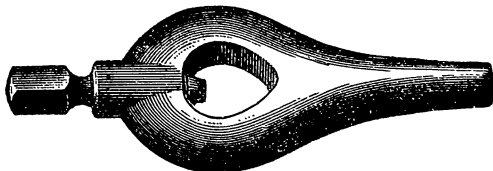
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## LE COUNT'S STRAIGHT TAIL DOG,

WITH STEEL SCREWS.

U. S. Standard, and the points hardened. To be driven from a stud in the face plate.

It is from the same pattern as the Heavy Steel Dog, and warranted, like that, not to break with any work.



This pattern will stand much more than a bent tail, and some prefer them on account of their direct action on the work.

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| 1.....   | $\frac{3}{4}$ ..... | \$0 60 | 11..... | $\frac{2}{3}$ ..... | \$1 45 |
| 2.....   | $\frac{1}{2}$ ..... | 70     | 12..... | $\frac{3}{4}$ ..... | 1 60   |
| 3.....   | $\frac{1}{4}$ ..... | 70     | 13..... | $\frac{3}{8}$ ..... | 1 80   |
| 4.....   | $\frac{1}{8}$ ..... | 80     | 14..... | $\frac{1}{2}$ ..... | 2 10   |
| 5.....   | $\frac{1}{4}$ ..... | 80     | 15..... | $\frac{3}{4}$ ..... | 2 75   |
| 6.....   | $\frac{1}{2}$ ..... | 95     | 16..... | $\frac{1}{2}$ ..... | 3 25   |
| 7.....   | $\frac{1}{4}$ ..... | 95     | 17..... | $\frac{3}{8}$ ..... | 4 00   |
| 8.....   | $\frac{1}{8}$ ..... | 1 10   | 18..... | $\frac{1}{4}$ ..... | 5 00   |
| 9.....   | $\frac{1}{4}$ ..... | 1 20   | 19..... | $\frac{3}{8}$ ..... | 6 00   |
| 10.....  | $\frac{1}{2}$ ..... | 1 35   | 20..... | $\frac{1}{2}$ ..... | 7 00   |
| One set to $\frac{1}{4}$ inch, \$7.80. Full set, \$14.10 |                     |        |         |                     |        |

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Manufacturers of  
**PATENT STEEL**  
(Blunt and Sharp)  
**TOE-CALKS.**  
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BURKE'S IMPROVED  
**HORSESHOERS'**  
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Send for Circulars.  
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**Crescent**  
**Horse and Mule Shoes,**  
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**CRESCENT HORSE SHOE**  
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Pat. Jan. 20, 1880.

Cut One-half Size.  
Sample pair sent to any hardware or saddlery firm by addressing

The Frost Thill Spring Co.,  
Boston, Mass.

**P. J. Conroy & Co.,**

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**"CONROY"**  
**Refrigerator Door**

**Fasteners**

Have rapidly supplanted all others.

Refrigerator Trimmings.

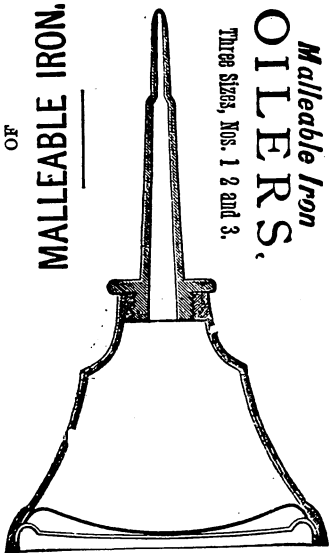


Pat. Dec. 15, '85

# BUFFALO SCALE CO., Buffalo, N. Y. SCALES OF ALL KINDS.

Patented Articles  
OF  
**MALLEABLE IRON.**

**New Improved  
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Malleable Iron  
OILERS.**  
Three Sizes, Nos. 1 2 and 3.

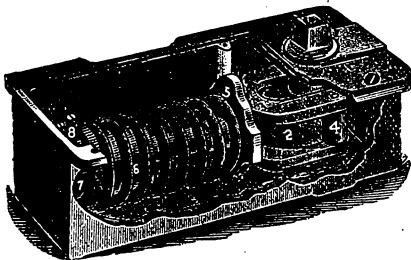


**Hammer's** Adjustable Clamps.  
Mall. Iron Hand Lamps.  
M. I. Hanging Lamps

New Pattern Heavy Screw Clamps.  
Strongest in the market.

For Sale by all the Principal Hardware Dealers.  
SEND FOR PRICE LIST.  
**MALLEABLE IRON CASTINGS**  
of superior quality, and Hardware Specialties  
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## CHECKING SPRING HINGES

For Double or Single Acting Doors.

Applied in floor under door. They close the door gently, without noise or violence, and stop it at once at the center. Doors cannot sag, springs do not break or set. Send for new price-list.

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## CHAMPION METAL WINDOW SASH CHAINS

to their customers as a reliable substitute for Sash Cords, very strong and lasting (some in daily use ten years), and gives thorough satisfaction wherever used. The patented attachments are very simple and can be applied to any window.

MANUFACTURED ONLY BY

**"THOMAS MORTON,"**

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Write for Prices.

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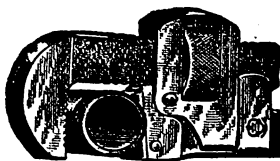
**The Practical Polish and Varnish Maker.**  
By H. C. STANDAGE. A treatise containing 750 receipts and formulae for the manufacture of varnishes, polishes, &c. 12mo, cloth.....\$2.50  
For Sale by DAVID WILLIAMS, 98-102 Rensselaer St., N.Y.



Improved Adjustable S-Wrench.  
Case-Hardened Throughout. Parts Interchangeable.

For Circulars and Price-List, address

**BEMIS & CALL HARDWARE & TOOL CO.,**  
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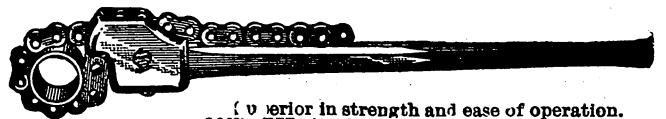
## TRIMO PIPE WRENCH,

Forged Steel

All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no trouble in close quarters. Does not crush the pipe.

**TRIMO  
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PIPE  
WRENCH.**



Superior in strength and ease of operation.  
COMPLETE circular grip. Never slips nor crushes.

Can be used with one hand and in closer quarters than any other Basin Wrench. Parts Interchangeable.

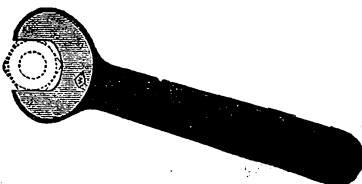


**TRIMO  
BASIN WRENCH.**

**TRIMONT MFG. CO.,** ROXBURY MASS.

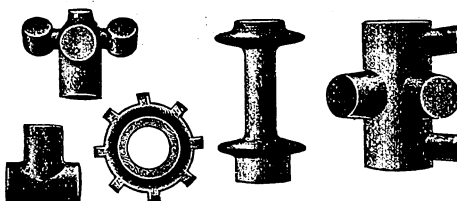
## SINGLE AND DOUBLE HEAD WRENCHES.

Furnished Finished or Unfinished. Drop-Forged from Steel.



The finished Wrenches are milled to fit U. S. Standard finished Nuts and are polished and case hardened. In stock for all sizes bolts from 1/8 inch to 2 1/4 inches inclusive.

**J. H WILLIAMS & CO.,** 9-15 RICHARDS ST.,  
BROOKLYN, N. Y.  
Iron, Steel, Copper and Bronze Drop-Forgings



**WYMAN & GORDON**  
WORCESTER, MASS.  
**DROP FORGINGS**

## C AND MACHINISTS' CLAMPS

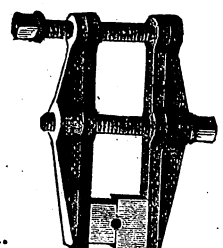
Drop Forged from Bar Steel.

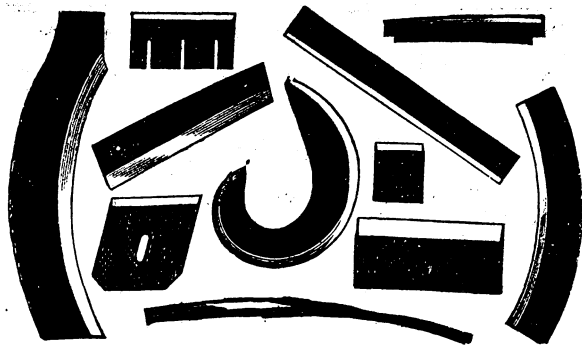
C Clamps, in 5 Sizes,  
with Openings  
1 1/4, 2 1/4, 3 1/4, 4 1/2, 6 1/2 inches.

Machinists' Clamps, in 4 Sizes,  
with Openings  
1 1/4, 2 1/4, 3 1/4, 4 1/4 inches.

Drop Forgings of every description.

**THE BILLINGS & SPENCER Co., Hartford, Conn.**





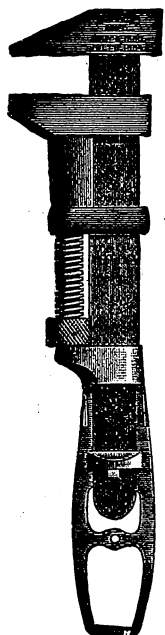
# LORING COES & CO.

WORCESTER, MASS.

Manufacturers of MACHINE KNIVES.

Shear Blades and Strips, Moulding Cutter Plate, Die Stock for Leather, Cloth and Paper Cutting Dies. Lawn Mower and Hay Cutter Knives of every description.

End view of Plated Stock for Dies, Lawn Mower Knives, Blades Etc., showing how the Steel is laid.



## L. COES'

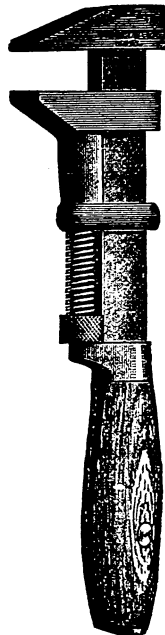
Genuine Improved  
KNIFE HANDLE  
PATENT

## Screw Wrenches

MANUFACTURED BY  
COES WRENCH CO.,  
WORCESTER, MASS.

Established in  
1839.  
Registered  
March 31, 1874.

Patented July  
6, 1880.  
Patented July  
8, 1884.



Sectional View Illustrates our New Knife Handle, showing Malleable Iron Frame and Shank of Bar keyed into position.

17 Straight Bar, Extra Long Nut for Screw in Jaw.

The BEST MADE and STRONGEST WRENCH in the MARKET.

J. C. McCARTY & CO.,  
JOHN H. GRAHAM & CO., } New York Agents.

## STAR MANUFACTURING CO.,

Carpentersville, Kane Co., Ill.

MANUFACTURERS OF



## PLOW SHARES.

Plow Moldboards,  
Landside Plates,  
Landside Points.

Lister Shares, Fin Cutters, Cultivator Shovels, Cultivator Shovel Points, Plow Points, Screw Coulter Hubs.

Mention IRON AGE.

THE TOPLIFF & ELY CO.,  
MAKERS.



BUCK  
"I"  
PRUNER

ELYRIA, OHIO.

Every Pair Warranted.  
Liberal Discount to  
Trade.

• IMPROVED MINE LAMP •  
FOR ANTHRACITE AND  
BITUMINOUS MINING  
6 DIFFERENT STYLES OF SPOUTS.  
SAMPLE 15¢.  
B.E. LEONARD, Scranton, Pa.

SEAMLESS BRASS COLLAR  
BRASS HINGE Lid Solid  
NO SOLDERING

**RIVAL**  
Pat. Lawn Sprinkler  
Cheapest and Best in Use.  
The Spray from it covers up  
wards of 1,000 sq. feet of lawn.  
It is the only patent adjustable  
sprinkler which is adaptable to  
any water pressure. Be-  
ing made of brass, and hav-  
ing no revolving parts to  
wear out, or small openings  
to clog up, it can be oper-  
ated with sandy or muddy  
water as well as clear, and  
will last for years. To oper-  
ate, screw sprinkler on  
end of hose, stick thered in  
to the ground in a vertical position, adjust the  
acorn to suit pressure and spray  
wanted and it is ready for use. It  
may be so regulated as to throw a  
spray as coarse as rain or as fine as  
mist, and will make one of the most  
beautiful fountains imaginable. It  
is unequalled in merit, and at a  
attention and is sold at a less price  
than any sprinkler in the market.  
Remember, the RIVAL is the only  
sprinkler made by which the  
coarseness of the spray and the area  
to be wet can be regulated. They  
are packed 1 doz. in a box, and fin-  
ished either plain or nickel plated.

Agents Wanted. Liberal  
discount to buyers.

1/4 Inch Regular Hydrant Thread,  
(or Pipe Thread to order) per doz \$7.50  
1 Inch Reg. Gas Pipe Thread, " " 12.00  
1/2" Sample Sprinkler sent prepaid  
on receipt of 60 cents.

to the ground in a vertical position, adjust the  
acorn to suit pressure and spray  
wanted and it is ready for use. It  
may be so regulated as to throw a  
spray as coarse as rain or as fine as  
mist, and will make one of the most  
beautiful fountains imaginable. It  
is unequalled in merit, and at a  
attention and is sold at a less price  
than any sprinkler in the market.  
Remember, the RIVAL is the only  
sprinkler made by which the  
coarseness of the spray and the area  
to be wet can be regulated. They  
are packed 1 doz. in a box, and fin-  
ished either plain or nickel plated.

The JOHN H. MCGOWAN & CO.  
Cincinnati, Ohio.

**COLDWELL**  
LAWN MOWER CO.,  
Newburgh, N. Y.

IMPERIAL

THE BEST MOWER MADE.  
The Lightest Running Mower in the World.  
This is the only Lawn Mower that stood the  
test of working the entire season on the Co-  
lumbian Exposition Grounds without any re-  
pairs.

# WHEEL

## BARROWS.

Wood, Iron, Steel,  
for Ore, Coal, Fur-  
naces, Brickyards,  
Stoneyards, Farm  
and Garden Use.

The

Kilbourne & Jacobs Mfg. Co.,

COLUMBUS, O., U. S. A.

Reliable Torches are  
what you want.



Made either for Oil or  
Gasoline.



These Torches are particularly adapted for use in  
Factories, Foundries, Machine Shops, Rolling Mills,  
Blacksmith Shops, Warehouses, &c. They make a  
strong white light, are free from smoke and are not  
affected by wind or rain. They are convenient and  
portable. These Torches can be run at an expense of  
about one-half cent to one cent per hour, burning a  
bright, steady light which is ten times greater than  
the light of an ordinary gas burner.  
Write us for prices. A liberal discount given to the  
trade. Manufactured by  
**THE SCHNEIDER & TRENKAMP CO.,**  
Nos. 479 to 497 Case Ave., Cleveland, Ohio.

### McKINNON DASH & HDW. CO.,

LIMITED, Manufacturers of

FINE QUALITY

## DASHES

AND

## FENDERS,

O PATTERN.

SURREY DASH.

BUFFALO. - N. Y.

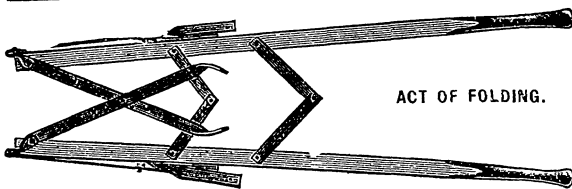
### The "MAJOR" Hog Ring and Ringer.



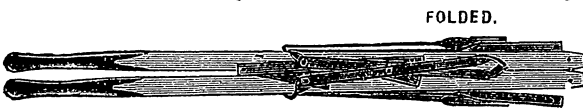
Send for 1894  
Catalogue and Prices.



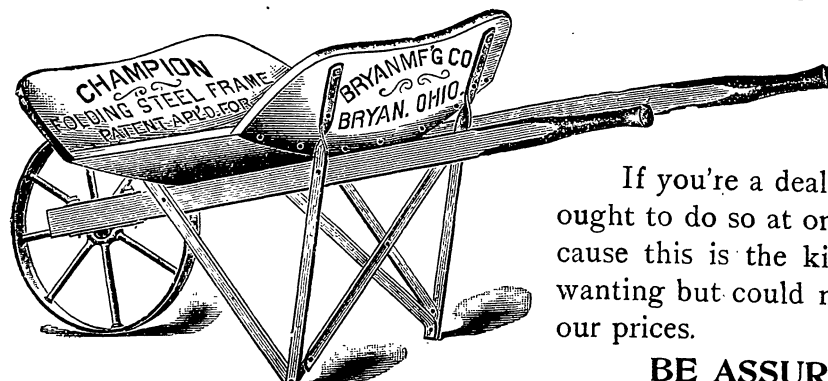
Hardware Specialties.  
**OAKES & IRWIN,**  
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ACT OF FOLDING.



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### Beats 'Em All.

If you're a dealer and haven't ordered a sample you  
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cause this is the kind of barrow your customer's been  
wanting but could never get. Write us anyway and get  
our prices.

BE ASSURED IT WILL PAY YOU.

ALL STEEL

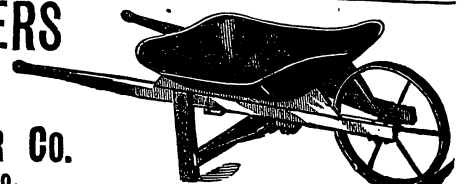
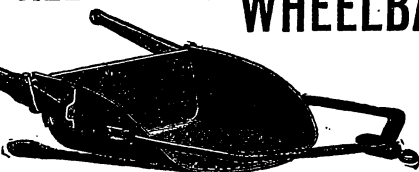
## WHEELBARROWS & SCRAPERS

MANUFACTURED BY

### AMERICAN STEEL SCRAPER CO.

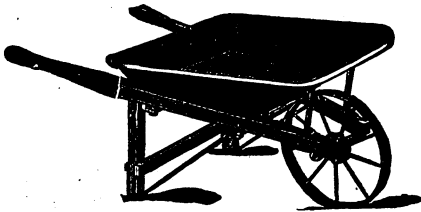
104 Court Street, SIDNEY, O.

Write  
for  
Catalogue



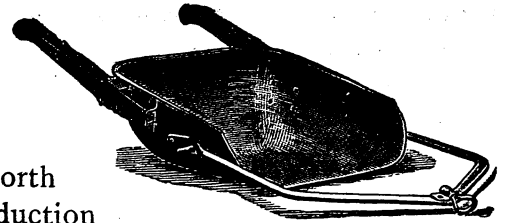
# ONE MOMENT.

Have you bought your spring stock?

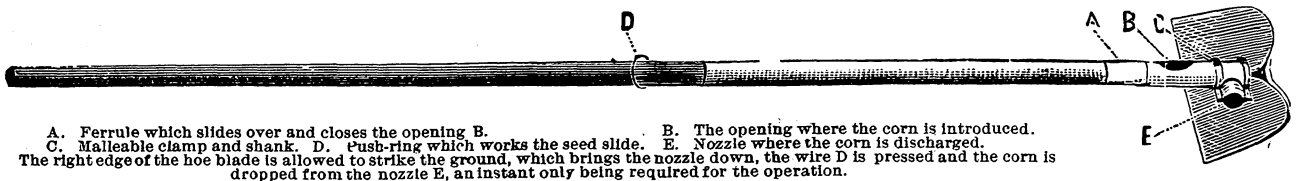


If not don't you think it worth while to investigate our production before doing so? We can and will make it interesting to you if you will write us.

**Sidney Steel Scraper Co.,** 924 Poplar Street, **SIDNEY, OHIO.**



## AYERS' COMBINED HAND PLANTER AND HOE.



A. Ferrule which slides over and closes the opening B. B. The opening where the corn is introduced.  
C. Malleable clamp and shank. D. Push-ring which works the seed slide. E. Nozzle where the corn is discharged.  
The right edge of the hoe blade is allowed to strike the ground, which brings the nozzle down, the wire D is pressed and the corn is dropped from the nozzle E, an instant only being required for the operation.

This is a convenience everywhere, besides being the only planter adapted for hard, rough and rocky ground requiring a hoe in covering and in such cases it enables the workman to accomplish twice the usual service. For replanting and first hoeing it is especially adapted, as it is both a hoe and planter as required. As a hoe it is cheap at 50 cts., which leaves only \$1.50 as the additional cost for the planter, which is nothing in comparison to the convenience of always having a planter in hand supplied with seed during the operation of hoeing. With beans and peas it is even more accurate than with corn. There is hardly a farmer in the country who would not find it an economy to have one of these planters, however many other planters he may have or however good they may be. Price \$2.00, \$15.00 per doz., \$7.50 per ½ doz., cash with order. Shipments f. o. b., New York or Petersburg, Va., as desired. Correspondence solicited.

**J. R. AYERS,** Patentee and Manufacturer, **PETERSBURG, VA.**

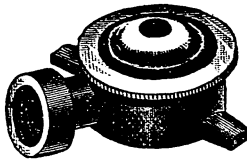


Japanese No. 12,  
Adjust.

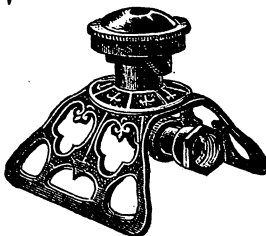
### LAWN SPRINKLERS.

We manufacture the BEST and CHEAPEST Lawn Sprinklers in the World.

Cactus No. 3.



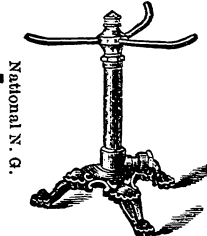
The only Sprinklers which have no revolving parts to leak or wear out.  
The only Sprinklers free from small holes, and which cannot become clogged with gritty substances.  
The only Sprinklers which are adjustable and will give a spray as fine as the mist of Niagara, or as heavy as the area of the supply pipe.  
The best Sprinklers for high pressures, and the only sprinklers which will give satisfaction with low pressures.  
We also manufacture the old style revolving sprinklers, but for our own use would not have them.



Cactus No. 5.

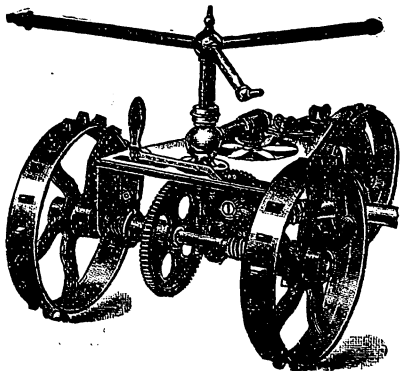
**Ette & Henger Mfg. Co.**

ST. LOUIS, MO.



National N. G.

SEND FOR DESCRIPTIVE CIRCULARS.



### LITTLE GIANT Traveling Lawn Sprinkler.

PATENTED.

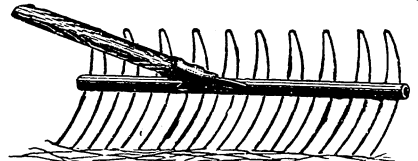
Can be set to travel anywhere from 15 to 500 feet per hour, either on a straight line or in a circle, and can be gauged to throw water over a swath 5 to 50 feet in width.

Highest Award at World's Columbian Exhibition.

SEND FOR CIRCULAR.

**PORTLAND LAWN SPRINKLER CO.,**  
PORTLAND, ME.

### The Old Reliable!



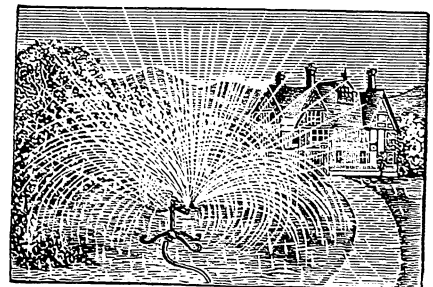
### DEALERS AND JOBBERS!

Do not be deceived by the **CHEAP** Sheet Metal imitations of our Rake. Take a sheet metal rake at each end and you can twist it **ALL OUT OF SHAPE!** They are **WEAK!** Don't be deceived into buying post-hole diggers that are flimsy imitations and offered as "just as good." Certain parties are copying nearly our whole line of goods, even to our style of ad., to deceive buyers. We have the **ORIGINAL** line of Riggers, Rakes, Curry-Combs, Pruning Shears, &c. Ask for **KOHLER'S** and get the **GENUINE, ORIGINAL and BEST!**

**F. E. KOHLER & CO.,** Canton, Ohio.

GENUINE

### "CALIFORNIA" Lawn Sprinkler.



MANUFACTURED BY

**BLAIR MANUFACTURING CO.**  
SPRINGFIELD, MASS.

Write for prices.

Also makers of the most complete line of Lawn Mowers on the market.

**BOOKS.** YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing **DAVID WILLIAMS,** Publisher and Bookseller, 96-102 Reade Street, New York.

The Synonym for Perfection in

Lawn Mowers is **"PENNSYLVANIA."**

 Please Read following:—

### HOW DO THEY WEAR?

"A single straw shows which way the wind blows."


"I have used this Pennsylvania Machine nearly 15 years and only paid out 5 cents on it, and to-day does as good work as it ever did."

(Signed),

Jan. 17, 1894.

L. OSBORN,

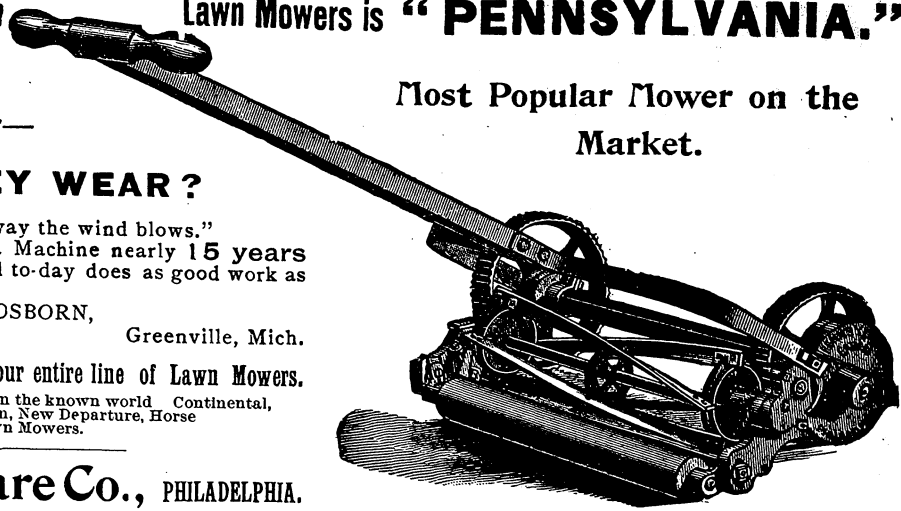
Greenville, Mich.

 Highest Award at World's Fair on our entire line of Lawn Mowers.

Largest manufacturers of Lawn Mowers in the known world Continental,  
New Quaker City, Great American, New Departure, Horse  
and Two-man Lawn Mowers.

**Supplee Hardware Co., PHILADELPHIA.**

Most Popular Mower on the  
Market.



## McGuire's ♦ Diamond.

MANUFACTURED BY

**Dille & McGuire Mfg. Co.,**  
**RICHMOND, IND., U. S. A.**

### PRICE-LIST.

Wheels, 8 Inches High. Cutter, 5½ Inches Diameter.

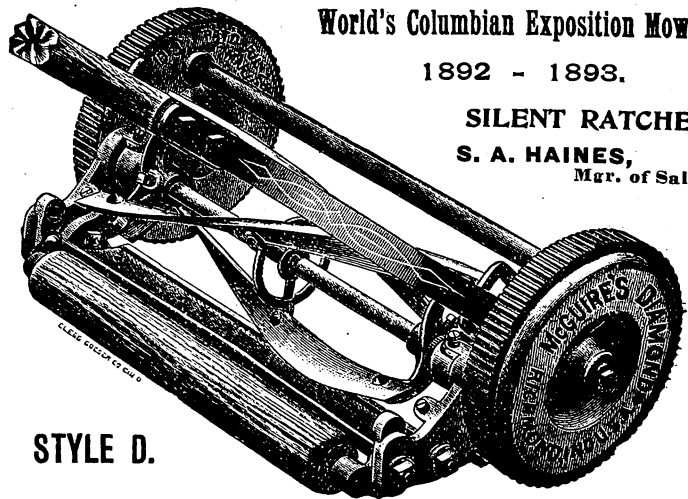
| LENGTH. | LIST.   |                 |
|---------|---------|-----------------|
| 10 inch | \$13.00 | Discount to the |
| 12 "    | 14.00   | Trade,          |
| 14 "    | 15.00   | 70 per cent.,   |
| 16 "    | 16.00   | F.O.B. Factory. |
| 18 "    | 17.00   |                 |

PHOSPHOR BRONZE JOURNAL BEARINGS. BEST QUALITY STEEL.

This is the Mower contracted for by the Chief of Construction at the Columbian Exposition; was used on the lawns at the World's Fair grounds during the preparatory season of 1892, and being approved by the Landscape Architects, was adopted exclusively for 1893.

If you wish a first-class Mower in all respects, one that is fully warranted,

**—BUY MCGUIRE'S DIAMOND.—**



STYLE D.

—OFFICIAL—

World's Columbian Exposition Mower.

1892 - 1893.

SILENT RATCHET.

S. A. HAINES,  
Mgr. of Sales.

**Chadborn & Coldwell**  
**Mfg. Co.,**

NEWBURGH, N. Y.,  
—Sole Manufacturers of—



New Model  
AND  
Excelsior  
LAWN  
MOWERS  
ALSO  
The Rival,  
The O K,  
Etc., Etc.

Send for Illustrated Catalogue.

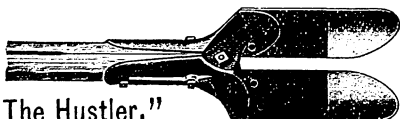
"The Hustler."



By buying the Hustler Lawn Rakes you have the cheapest and best made. All leading jobbers handle them.

**GIBBS MFG. CO, Canton, Ohio.**

Our line of Post Hole Diggers comprises 5 of the Best Known Styles on the market. Prices low.

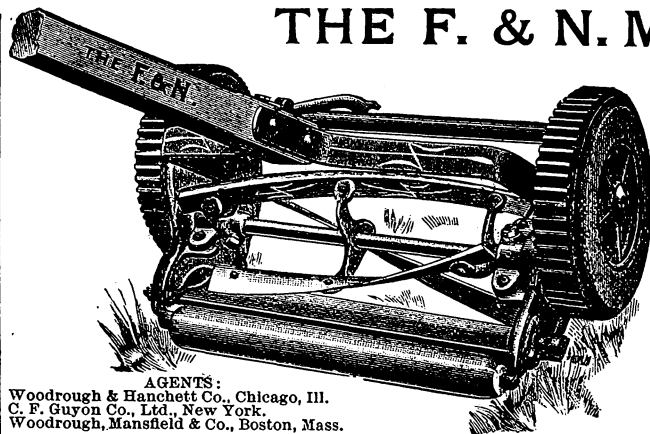


"The Hustler."

**THE F. & N. MFG. CO.,**

Manufacturers of  
Lawn Mowers  
and  
Grass Catchers,  
RICHMOND, IND., U. S. A.

**THE  
F. & N.  
LAWN  
MOWER  
" '94."**



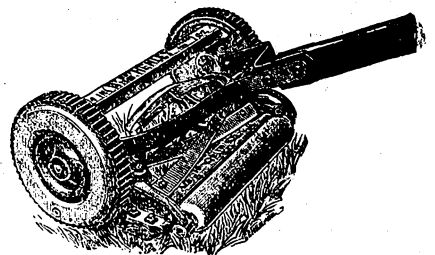
AGENTS:  
Woodrough & Hanchett Co., Chicago, Ill.  
C. F. Guyon Co., Ltd., New York.  
Woodrough, Mansfield & Co., Boston, Mass.

Solid Steel Cutter Bar. Reel-Knives adjusted to Cutter Bar. Phosphor Bronze Reel-Bearings.

## HENLEY'S MOWERS

For Lawns and Parks

Are first class, high grade machines, made of the best materials, neat, symmetrical, strong and unexcelled in construction and ease of operation. Does perfect work. For prices, address



**M. C. HENLEY, Sole Mfr., Richmond, Ind., U. S. A.**

EASTERN REPRESENTATIVES: H. S. Earle, 110 and 112 N. Warren St., Syracuse, N. Y.; Wm. H. Cole & Sons, 13 S. Charles St., Baltimore, Md.; Carpenter & Bayles, 91 Chambers St., New York City.



# WROUGHT WASHERS



True  
to  
Gauge

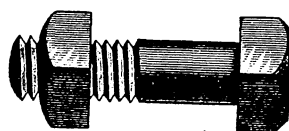
Made from *specially rolled* plate by our own *patented machinery*.

Every washer *flat*, with hole in *true center*. Sold in 200 lb. kegs, or 1 and 5 lb. paper boxes.

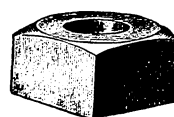
Get prices.

THE MILTON MANUFACTURING CO., MILTON, PA.

## HIGH GRADE



Machine  
Bolts



Hot pressed  
Nuts

Stamped to size. Guaranteed extra quality.  
Send for catalogue.

# Pennsylvania Bolt & Nut Co.

Lebanon Pa.

MANUFACTURERS OF

REFINED BAR-IRON · MACHINE-BOLTS · TRACK-BOLTS · & BOLT-ENDS ·  
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CHAMFERED & TRIMMED NUTS · WROUGHT & CAST WASHERS · TURN-BUCKLES ·  
STRUCTURAL & ELECTRICAL FORGINGS · BOILER & BRIDGE RIVETS · CAR FORGINGS & ARCH-BARS

## Genuine Philadelphia Lawn Mowers.

— Highest Award at the Field trial, World's Fair, Chicago, 1893. —

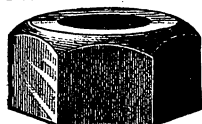
375,000 Machines Sold.

Hand, Pony and Horse Machines, Traveling Lawn  
Sprinkler, Lawn Sweeper and Collectors.

ACKNOWLEDGED STANDARD OF EXCELLENCE FOR 22 YEARS.

SEND FOR PRICE-LIST AND DISCOUNTS.

THE PHILADELPHIA LAWN MOWER CO., { Successors to Graham, Passmore & Co., } 3107 & 3109 Chestnut St., Philadelphia, Pa.



PORTCHESTER BOLT & NUT CO.

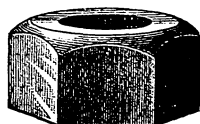
Port Chester, N. Y.

MANUFACTURERS OF

BOLTS, NUTS, RIVETS and WASHERS

CHAMFERED AND TRIMMED.

SQUARE AND HEXAGON NUTS A SPECIALTY.

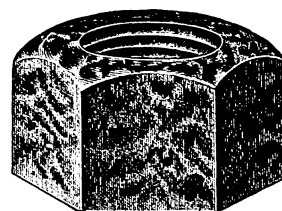


DUNHAM NUT CO.,

UNIONVILLE, CONN.,

Manufacturers of

All Grades  
of  
Finished  
Nuts  
and

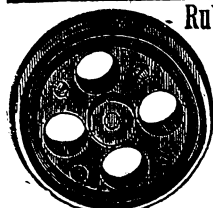


Automatic Cold Press Nut Machines.

SEND FOR CATALOGUE.

**BOLTS,** Machine, Car,  
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Cold Punched

AMERICAN BOLT COMPANY, - - Lowell, Mass.



Rubber and Iron Wheels

Casters for Trucks,  
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Mill use.

Catalogues free.

G. P. CLARK, Box O,  
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EXPANSION BOLTS.



Manufacturers of Single and Double,  
For fastening all kinds of Structure to Brick and Stone  
Work. Catalogue furnished on application.  
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INTERCHANGEABLE  
LOCK-CORNER SHELF BOXES,  
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FOR THE HARDWARE TRADE.  
A. H. GREEN,  
22 Park Place, New York.

WM. H. HASKELL, PRESIDENT.

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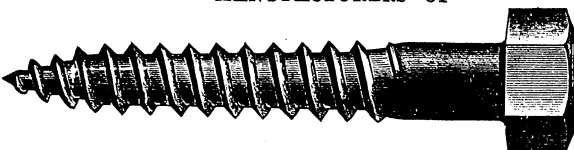
D. A. HUNT, AGENT.



GIMLET POINT  
COACH SCREWS

# WM. H. HASKELL CO.,

—MANUFACTURERS OF—



Bolts, Cold-Punched  
Nuts and Washers,  
SUITABLE FOR MACHINERY  
OF ALL KINDS.



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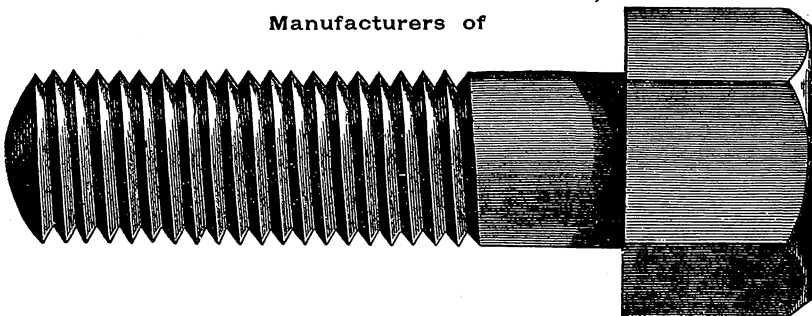
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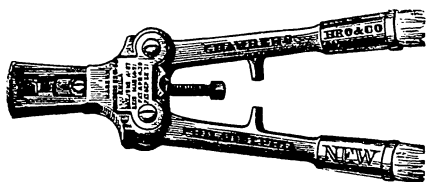


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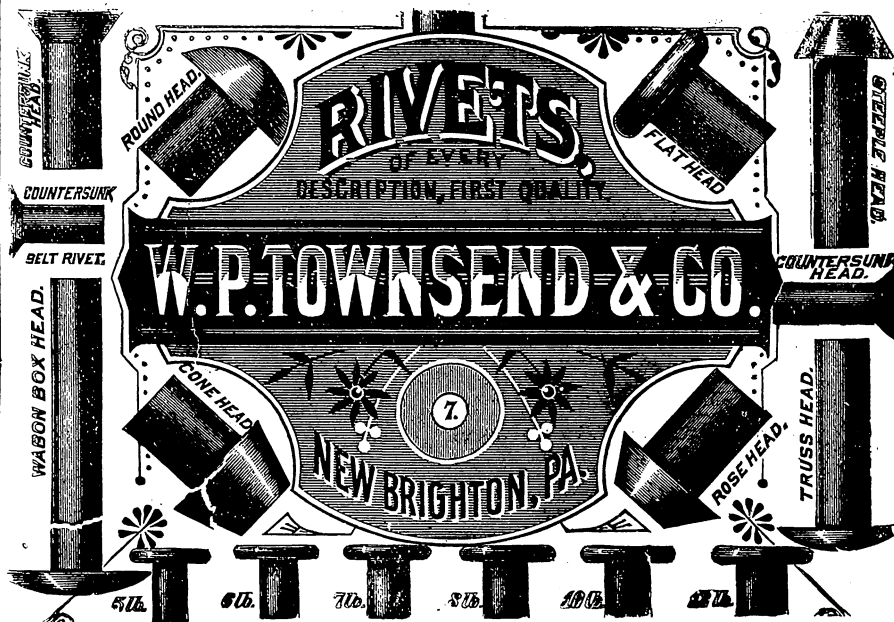
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Harrington, E., Son & Co., Phila.  
Lane Bros., Poughkeepsie, N. Y.  
Lidgerwood Mfg. Co., 96 Liberty, N. Y.  
McCoy, Jos. F. & Co., 26 Warren St., Maris & Beekley, Philadelphia.  
Moore Mfg. & Fdy. Co., Milwaukee, Wis.  
Morse, Williams & Co., Phila.  
Sellers, Wm. & Co., Phila. and N. Y.  
Speldel, J. G., Reading, Pa.  
Yale & Towne Mfg. Co., Stamford, Ct.

**Hollow Ware.**

Avery Stamping Co., Cleveland, O.  
Brouson Supply Co., Cleveland, Ohio.  
Cleveland Stamping & Tool Co., Cleveland, O.  
Stuart & Peterson Co., Phila., Pa.

**Hollow Ware, Aluminum.**

Illinois Pure Aluminum Co., Lemont, Ill.  
Wohler Aluminum Co., Chicago, Ill.

**Horse Nails, Makers of.**

Capewell Horse Nail Co., Hartford, Conn.  
National Horse Nail Co., Vergennes, Vt.  
Pumam Nail Co., Neponset, Boston, Mass.

**Horse and Mule Shoes, Makers of.**

Bryden Horse Shoe Co., Catsasauqua, Pa.  
Burden Iron Co., Troy, N. Y.  
Crescent Horse Shoe & Iron Co., Max Meadows, Va.  
Diamond State Iron Co., Wilmington, Del.  
Old Dominion Iron & Nail Works Co., Richmond, Va.  
Phenix Horse Shoe Co., Poughkeepsie, N. Y.  
Rhode Island Perkins Horse Shoe Co., Providence.  
Shoenberger & Co., Pittsburgh, Pa.  
Standard Horse Shoe Co., Boston, Mass.

**Hose Menders.**

Hudson, C. E. & Co., Leominster, Mass.  
Jones, M. D. & Co., Boston, Mass.

**Hose.**

Cleveland Rubber Works, Cleveland, O.  
N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.

**Hydrants, &c.**

McLean, John, 296 & 298 Monroe, N. Y.

**Hydraulic Forging.**

U. S. Projectile Co., Brooklyn, N. Y.

**Hydraulic Jacks.**

Dudgdon, Richard, 24 Columbia, N. Y.  
McCoy, Jos. F. Co., 26 Warren St., N. Y.

**Ice Breakers.**

Clement & Dunbar, Philadelphia, Pa.  
Wharton, Jos. S., Lovering, Phila., Pa.

**Ice Cream Cans.**

Stuart & Peterson Co., Phila., Pa.

**Ice Cream Freezers.**

Clement & Dunbar, Phila., Pa.  
North Bros. Mfg. Co., Phila., Pa.  
Packer, C. W., Philadelphia, Pa.  
White Mountain Freezer Co., Nashua, N. H.

**Injectors.**

Evon-Evans Mfg. Co., Philadelphia, Pa.  
Jenkins Bros., New York.

**Insurance, Boiler.**

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

**Iron and Steel, Swedish.**

Lundberg, Gustaf, Boston, Mass.  
Milne, A. & Co., 1 Broadway, N. Y.

**Iron Commission Brokers.**

Corning, Edw. & Co., 29 B'way, N. Y.  
Cotton, Barclay W. & Co., Phila.  
Ewing, Edw. J., Philadelphia.  
Hogan, John L. & Co., Philadelphia, Pa.  
Hoffman, J. W. & Co., Philadelphia.  
Levis, Henry & Co., Philadelphia.  
Keeley, Jerome & Co., Philadelphia.  
Lea, J. Tatnall & Co., Philadelphia.  
Mohr, J. J., 430 Walnut, Philadelphia.  
Pilling & Crane, Philadelphia, Pa.  
Wister, L. & R. & Co., Phila., Pa.

**Iron Ore.**

Samuel, Frank, Philadelphia, Pa.

**Iron, Merchants.**

Barns, C. K. & Co., Philadelphia, Pa.  
Borden & Lovell, 70 West, N. Y.  
Bussenius & Cunliffe, Philadelphia.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Cox, Justice, Jr., Philadelphia.  
Cotton, Barclay W. & Co., Phila.  
Hoffman, J. W. & Co., Philadelphia.  
Leonard, J., 446 West St., N. Y.  
Nicolls, Wheeler & Co., Philadelphia.  
Ogden & Wallace, 85 Elm St., N. Y.  
Pierson & Co., 29 Broadway, N. Y.  
Thomson, W. H. & Co., Phila., Pa.  
Wallace, Wm. H. & Co., Albany & Washington streets, N. Y.  
Whitney, A. B. & Co., 17 B'way, N. Y.  
Wilson, E. H. & Co., Philadelphia.

**Iron, Importers.**

Abbott, Wheelock & Co., N. Y. and  
Lundberg, Gustaf, Boston, Mass.

**Iron, Sheet, Manufacturers of.**

Cambridge Iron & Steel Co., Cambridge, Ohio.  
W. Dewees Wood Co., Lim., McKeesport, Pa.

**Iron Vases.**

Walbridge & Co., Buffalo, N. Y.

**Ironwork, Ornamental.**

Barnum, E. T., Detroit, Mich.  
Champion Iron Co., Kenton, O.  
Ludlow-Saylor Wire Co., St. Louis, Mo.  
Mast, Foss & Co., Springfield, O.  
The Van Dorn Iron Works Co., Cleveland, O.

**Keys.**

Wollensak, J. F., Chicago, Ill.

**Ladders, Rolling.**

Coburn Trolley Track Mfg. Co., Holyoke, Mass.

**Lades.**

Detroit Fdy. Equipment Co., Detroit, Mich.

**Lamps.**

Standard Lighting Co., Cleveland, O.

**Lamp Stoves.**

Glaizer Stove Co., Chelsea, Mich.

**Lanterns.**

Steam Gauge & Lantern Co., Syracuse, N. Y.

**Lathes.**

Dietz, Schumacher & Co., Cincinnati, O.  
Draper Machine Tool Co., Worcester, Mass.  
Harrington, E. Son & Co., Phila., Pa.  
Johnson, Israel H., Jr., & Co., Philadelphia, Pa.  
Sebastian Lath Co., Cincinnati, O.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

**Lathing, Wire.**

Clinton Wire Cloth Co., Clinton, Mass.  
N. J. Wire Cloth Co., Trenton, N. J.  
Wright & Colton Wire Cloth Co., Worcester, Mass.

**Laundry Machines.**

Johnson, S. C., Racine, Wis.

**Lawn Mowers.**

Blair Mfg. Co., Springfield, Mass.  
Chadborn & Coldwell Mfg. Co., Newburg, N. Y.  
Coldwell Lawn Mower Co., Newburg, N. Y.  
Dille & McGuire Mfg. Co., Richmond, Ind.  
Enterprise Mfg. Co., Philadelphia, Pa.  
F. & N. Mfg. Co., Richmond, Ind.  
Hensley, M. C., Richmond, Ind.  
Mast, Foss & Co., Springfield, O.  
Philadelphia Lawn Mower Co., Philadelphia, Pa.  
Supplee Hdw. Co., Phila., Pa.

**Lawn Rakes.**

Gibbs Mfg. Co., Canton, Ohio.  
Kohler, F. E. & Co., Canton, O.

**Lawn Sprinklers.**

Blair Mfg. Co., Springfield, Mass.  
Enterprise Mfg. Co., Phila., Pa.  
Ette & Henger Mfg. Co., St. Louis, Mo.  
Gibbs Mfg. Co., Canton, Ohio.  
McGowan, John H. Co., Cincinnati, O.  
Portland Lawn Sprinkler Co., Portland, Me.

**Lemon Squeezers.**

Ripley Mfg. Co., Unionville, Conn.

**Letters and Figures, Metallic.**

White, A. A. & Co., Providence, R. I.

**Letters, Paper.**

Tablet & Ticket Co., Chicago, Ill.

**Levels.**

Richardson, C. F. & Son, Athol, Mass.

**Locks and Knobs, Manufacturers of.**

Deitz, A. E., 97 Chambers, N. Y.  
Reading Hdw. Co., Reading, Pa.  
Smith & Egge Mfg. Co., Bridgeport, Conn.

Yale & Towne Mfg. Co., Stamford, Conn.

**Lubricants.**

Dixon, Jos., Crucible Co., Jersey City, N. J.

**Machinery.**

Am. Tool Works, Cleveland, Ohio.  
Barnes, W. F. & John, Rockford, Ill.  
Bement, Miles & Co., Philadelphia, Pa.  
Bigelow, C. E., 45 Dey, N. Y.  
Bisnall & Keeler Mfg. Co., St. Louis.  
Bliss, E. W. Co., Brooklyn, N. Y.  
Bridgeport Mch. Tool Works, Bridgeport, Conn.  
Briggs, Marvin, 12 Broadway, N. Y.  
Carlin's Sons, Thos., Allegheny, Pa.  
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.  
Detrick & Harvey Mch. Co., Baltimore, Md.  
Dietz, Schumacher & Co., Cincinnati, Ohio.  
Fitchburg Mch. Works, Fitchburg, Mass.  
Garvin Mch. Co., Laight & Canal Sts.  
Gould & Eberhardt, Newark, N. J.  
Hamilton Mch. Tool Co., Hamilton, O.  
Harrington, E. Son & Co., Phila., Pa.  
Hender, A. L., Wilmington, Del.  
Hendey Machine Co., Torrington, Ct.  
Hill, Clarke & Co., Boston, Mass.  
Howard & Morse, 45 Fulton St., N. Y.  
Hulbut-Rogers Mch. Co., South Sudbury, Mass.  
Johnson, Israel H., Jr., & Co., Phila.  
Jones & Lamson Mch. Co., Springfield, Vt.  
Lodge & Davis Mch. Tool Co., Cincinnati, O.  
Lodge & Shipley Mch. Tool Co., Cincinnati, O.  
Lovegrove & Co., Philadelphia, Pa.  
McCabe, J. J., 68 Cortlandt, N. Y.  
Machinery's Supply Co., Rochester, N. Y.  
Manville, E. J., Mch. Co., Waterbury, Conn.  
Newark Mch. Tool Wks., Newark, N. J.  
New Haven Mfg. Co., New Haven, Ct.  
New York Machinery Depot, 178 Broadway, New York.  
Niles Tool Wks., 138 Liberty St., N. Y.  
Pittsburgh Mfg. Co., Pittsburgh, Pa.

Place, Geo., 120 Broadway, N. Y.  
 Poole, Robt. & Son Co., Baltimore, Md.  
 Powell Planer Co., Worcester, Mass.  
 Pratt & Whitney Co., Hartford, Conn.  
 Proutis Tool & Supply Co., N. Y.  
 Scranton Supply & Mchry. Co., Scranton, Pa.  
 Sellers, Wm. & Co., Phila.  
 Seyfert's Sons, L. F., Philadelphia, Pa.  
 Steptoe, J. & Co., Cincinnati, O.  
 Stow Flexible Shaft Co., Ltd., Phila.  
 Toomey, Frank, Philadelphia, Pa.  
 Wetherill, Robt. & Co., Chester, Pa.  
 Wickes Bros., Saginaw, Mich.  
 Wilson, W. A., Rochester, N. Y.

#### Machinery for Hardware Manufacturers.

Adt, Jno. & Son, New Haven, Conn.

#### Machine Knives.

Loring, Coes & Co., Worcester, Mass.  
 Loyd, John, 558-562 Water St., N. Y.  
 Simonds Mfg. Co., Fitchburg, Mass.

#### Machine Tools.—See Machinery.

#### Machine Work.

Papping, J., 58th St. & 11th Ave., N. Y. City.

#### Machinists' Scales

Coffin & Leighton, Syracuse, N. Y.  
 Starrett, L. S., Athol, Mass.

#### Machinists' Tools and Supplies.

King, J. M. & Co., Waterford, N. Y.  
 Sellers, Wm. & Co., Inc., Phila.

#### Mallets.

N. Y. Mallet & Handle Works, N. Y.

#### Mangles.

Johnson, S. C., Racine, Wis.

#### Manufacturing Sites.

Illinois Central R. R., Chicago, Ill.

#### Measuring Tapes.

Keuffel & Esser Co., N. Y.  
 Lufkin Rule Co., Saginaw, Mich.

#### Mechanical Instruction.

Correspondence School of Mechanics, Scranton, Pa.

#### Metals.

Fearing, Wm. S., 100 Chambers, N. Y.  
 Hendricks Bros., 49 Cliff, N. Y.

#### Metal Brokers.

American Metal Co., N. Y.

#### Metallurgists.

Britton, J. Blodgett, Phila., Pa.

#### Mining Knives.

Palmer Hdw. Mfg. Co., Troy, N. Y.

#### Mine Lamps.

Darby, Edw. & Sons, Phila., Pa.  
 Leonard, B. E., Scranton, Pa.

#### Mining Screens.

Harrington & King Perforating Co., Chicago, Ill.  
 Howard & Morse, 45 Fulton, N. Y.

#### Models, Makers of.

Franklin, H. H. Mfg. Co., Syracuse, N. Y.  
 Ideal Machine Works, Hartford, Conn.  
 Rhodes, L. E. Co., Hartford, Conn.

#### Molding Sand.

Obermayer, S. Co., Cincinnati, O.

#### Motors, Water and Electric.

C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.  
 Dallett, Thomas H. & Co., Phila., Pa.

#### Nail Machinery.

Pittsburgh Mfg. Co., Pittsburgh, Pa.

#### Nail and Tack Pullers.

Graham, John H. & Co., 113 Chambers Street, N. Y.  
 Scranton & Co., New Haven, Conn.  
 Specialty Mfg. Co., Hartford, Conn.

#### Nails (Cut) and Spikes.

Borden & Lovell, 70 West N. Y.  
 Cumberland Nail & Iron Co., Phila.  
 Pottstown Iron Co., Pottstown, Pa.  
 Riverside Iron Wks., Wheeling, W. Va.  
 Valley Steel Co., St. Louis, Mo.

#### Nickel Platers' Supplies.

Eddy Electric Mfg. Co., Windsor, Conn.

#### Norway Shapes, Rollers of.

Rowland, William & Harvey, Frankford, Philadelphia.

#### Novelty Manufacturers.

Franklin, H. H. Mfg., Syracuse, N. Y.  
 Ideal Machine Works, Hartford, Conn.

#### Nut Machines.

Dunham Nut Co., Unionville, Ct.

#### Nuts, Bolts, &c., Makers of.

American Bolt Co., Lowell, Mass.  
 American Screw Co., Providence, R. I.  
 Blake & Johnson, Waterbury, Conn.  
 Dunham Nut Co., Unionville, Conn.  
 Haskell, Wm. H. Co., Pawtucket, R. I.  
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.  
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.  
 Port Chester Bolt & Nut Co., Port Chester, N. Y.  
 Russell, Burdall & Ward, Port Chester, N. Y.  
 Sternbergh, J. H. & Son, Reading, Pa.  
 Wilson, J. Fred., Worcester, Mass.  
 Wm. H. Haskell Co., Pawtucket, R. I.

#### Oilers.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

#### Oil Stones.

Pike Mfg. Co., Pike Station, N. H.

#### Oil Stoves.

Glazier Stove Co., Chelsea, Mich.

#### Ores.

Wister, Francis, Philadelphia, Pa.

#### Ox Bow Pins.

Sawyer, O. C., Sharon, Vt.

#### Ox Shoes.

Scranton Forging Co., Scranton, Pa.

#### Packing.

Morrison, Robert, St. Louis, Mo.  
 N. Y. Belting & Packing Co., Ltd., N. Y.

#### Padlocks.

Ames Sword Co., Chicopee, Mass.  
 Fraim, E. T., Lancaster, Pa.  
 Wolf, W. & L., Phila., Pa.  
 Shultze Mfg. Co., Phila., Pa.

#### Paint.

Garry Iron & Steel Roofing Co., Cleveland, O.

#### Paint Burners.

Dangler Stove & Mfg. Co., Cleveland, Ohio.

#### Paint Cans.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

#### Pants Stretcher.

Covert Mfg. Co., West Troy, N. Y.

#### Patent Solicitors.

Butler, C. N., Phila., Pa.  
 Howson & Howson, Philadelphia and Washington.  
 Jenner, H. W. T., Washington, D. C.  
 Stocking, E. B., Washington, D. C.

#### Perforated Metal.

Clinton Wire Cloth Co., Clinton, Mass.  
 Harrington & King Perforating Co., Chicago, Ill.  
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.

#### Phosphor Bronze.

Phosphor Bronze Smelting Co., Limited, Philadelphia.

#### Phosphor Tin.

Crescent Phosphorized Metal Co., Philadelphia, Pa.  
 Halk & Naumann, 516 Pearl, N. Y.

#### Picks and Mattocks.

Plumb, Fayette R., Philadelphia, Pa.

#### Pig Iron.

Houston, C. B. & Co., Philadelphia, Pa.  
 Montour Iron & Steel Co., Danville, Pa.  
 Naylor & Co., 45 Wall, N. Y.  
 Pilling & Crane, Philadelphia, Pa.  
 Samuel, Frank, Philadelphia, Pa.

#### Pig Iron Storage.

Am. Pig Iron Storage Warehouse Co., 44 Wall, N. Y.

#### Pile Drivers.

Vulcan Iron Works, Chicago, Ill.

#### Pipe, Bent.

National Pipe Bending Co., New Haven, Conn.

#### Pipe Cutting and Threading Machines.

Armstrong Mfg. Co., Bridgeport, Conn.  
 Bignall & Keeler Mfg. Co., St. Louis, Mo.  
 Derrick & Harvey Mch. Co., Baltimore, Md.  
 Merrill Mfg. Co., Toledo, O.  
 Pancoast, Henry B. & Co., Phila.  
 Saunders' Sons, D., Yonkers, N. Y.  
 Walworth Mfg. Co., Boston, Mass.

#### Pipe Grips.

Prentiss Vise Co., 44 Barclay, N. Y.

#### Pipes, Fittings, &c., Makers of.

McNab & Harlin Mfg. Co., N. Y.

#### Pipe, Water and Gas, Makers of.

Cumberland Nail & Iron Co., Phila., Pa.  
 Donaldson Iron Co., Emaus, Pa.  
 Riverside Iron Works, Wheeling, W. Va.  
 Wood, R. D. & Co., Philadelphia, Pa.

#### Plane Irons, Manufacturers of.

Buck Bros., Millbury, Mass.  
 Buck, Chas., Millbury, Mass.

#### Planers.

Derrick & Harvey Mch. Co., Baltimore, Md.  
 Powell Planer Co., Worcester, Mass.  
 Wilson, W. A., Worcester, Mass.

#### Planes, Manufacturers of.

Stanley Rule & Level Co., N. Y.

#### Planter and Hoe.

Ayers, J. R., Petersburg, Va.

#### Plated Ware.

Boardman, L. & Son, New Haddam, Ct.  
 Holmes & Edwards Silver Co., Bridgeport, Conn.  
 Kelley & McBean, Niagara Falls, N. Y.  
 Rogers, Wm. Mfg. Co., Hartford, Ct.

#### Plate, Iron and Steel, Mfrs. of.

Etna-Standard Iron & Steel Co., Bridgeport, O.  
 Lukens Iron & Steel Co., Coatesville, Pa.  
 Mahoning Valley Iron Co., Youngstown, Ohio.  
 Moorhead-McLean Co., Pittsburgh, Pa.  
 McIlvain & Sons, Reading, Pa.  
 Pottstown Iron Co., Pottstown, Pa.  
 Pottsville Iron & Steel Co., Pottsville, Pa.  
 Singer, Nimick & Co., Pittsburgh, Pa.  
 The Mahoning Valley Iron Co., Youngstown, O.  
 Wellman Iron & Steel Co., Thurlow, Pa.  
 Wood, Alan Co., Philadelphia.

#### Plating, Nickel, Brass and Silver.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

#### Plow Shares.

Star Mfg. Co., Carpentersville, Ill.

#### Pokes.

Bishop, A. W., Berea, Ohio.

#### Polishing Machines.

Watson & Stillman, 201 E. 42d, N. Y.

#### Post Hole Diggers.

Buckeye Mfg. Co., Union City, Ind.  
 Gibbs Mfg. Co., Canton, Ohio.  
 Wister, L. & R. Co., Phila., Pa.

#### Poultry Nettings.

Barnum, E. T., Detroit, Mich.  
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.  
 N. J. Wire Cloth Co., Trenton, N. J.  
 "Silver Finish."  
 Tyler Wire Works Co., W. S., Cleveland, O.  
 Wright & Colton Wire Cloth Co., Worcester, Mass.

#### Powder.

Lafin & Ran<sup>d</sup> Powder Co., 29 Murray New York Powder Co., 62 Liberty St., N. Y.

#### Power Hack Saws.

Millers Falls Co., 93 Reade St., N. Y.

#### Power Hammers.

Dienelt & Eisenhardt, Philadelphia.  
 Dupont Mfg. Co., St. Johnsbury, Vt.  
 Jenkins & Lingie, Bellefonte, Pa.  
 Scranton & Co., New Haven, Conn.

#### Power Transmitting Machinery.

Dodge Mfg. Co., Mishawaka, Ind.

#### Presses, Dies, &c.

E. W. Bliss Co., Brooklyn, N. Y.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Stark Mch. & Tool Co., Buffalo, N. Y.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Waterbury Mch. Co., Waterbury, Ct.

#### Presses, Power, Makers of.

Bliss, E. W. Co., Brooklyn, N. Y.  
 Manville, E. J. Mch Co., Waterbury, Ct.  
 Stark Mch. & Tool Co., Buffalo, N. Y.  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

#### Pruners.

Topliff & Ely Co., Elyria, Ohio.

#### Pulleys.

Brown, A. & F., 17 Dey St., N. Y.  
 Dodge Mfg. Co., Mishawaka, Ind.  
 Keystone Clutch Mch. Wks., Phila., Pa.  
 Lake, J. H. & D. Co., Massillon, O.

#### Pulverizing Mills.

Bradley Fertilizer Co., Boston, Mass.

#### Pumping Machinery.

Dean Bros. Steam Pump Works, Indianapolis, Ind.  
 Heller Corville Steam Pump Co., St. Louis, Mo.  
 McGowan, J. H. & Co., Cincinnati, O.  
 Maslin, J. & Son, Jersey City, N. J.  
 Norwalk Iron Works Co., So. Norwalk, Conn.  
 Southwark Fdy. & Mch. Co., Phila., Pa.  
 Vailor Pump Works, Easthampton, Mass.  
 Worthington, Henry R., 86 and 88 Liberty St., N. Y.

#### Pumps, Makers of.

Bellevue Pump Co., Bellevue, Iowa.  
 Deming Co., Salem, O.  
 Douglas, W. & B., Middletown, Conn.  
 Mast, Foss & Co., Springfield, O.  
 Myers, F. E. & Bro., Ashland, O.

#### Punches.

Richards, I. P., Providence, R. I.

#### Punches and Shears, Hand and Power.

E. W. Bliss Co., Brooklyn, N. Y.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Cross & Speirs Machine Co., Waterbury, Conn.  
 Henderer, A. L., Wilmington, Del.  
 Stark Mch. & Tool Co., Buffalo, N. Y.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.  
 Watson & Stillman, 204 E. 43d, N. Y.

#### Rails, Old and New.

Perry, W. H. & Co., Providence, R. I.

#### Rat and Mouse Traps.

Estey, W. S., 65 Fulton, N. Y.  
 Ripley Mfg. Co., Unionville, Conn.

#### Razors.

J. R. Torrey Razor Co., Worcester, Mass.

#### Reels.

Hendryx, A. B. Co., New Haven, Conn.

#### Refrigerator Door Fasteners.

Conroy, P. J. & Co., Philadelphia.

#### Rivers.

Blake & Johnson, Waterbury, Conn.  
 Boyce Rivet Co., Muncie, Ind.  
 Burden Iron Co., Troy, N. Y.  
 Clark & Cowles, Plainville, Conn.  
 Cobb & Drew, Plymouth, Mass.  
 Sternbergh, J. H. & Son, Reading, Pa.  
 Townsend, W. P. & Co., New Brighton, Pa.

#### Riveting Machines.

Adt, Jno. & Sons, New Haven, Conn.

#### Rock Drills.

Band Drill Co., 23 Park Place, N. Y.

#### Rolling Mill Machinery.

Birmingham Iron Fdry, Birmingham, Conn.  
 Booth, The Lloyd Co., Youngstown, O.  
 Leeburg Foundry & Mch. Co., Pittsburgh, Pa.  
 Morgan Construction Co., Worcester, Mass.  
 Robinson-Rea Mfg. Co., Pittsburgh.  
 Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.  
 Trethewey Mfg. Co., Pittsburgh, Pa.  
 Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.

#### Rolls, Chilled, Sand and Steel.

Birmingham Iron Foundry, Birmingham, Conn.  
 Booth, The Lloyd Co., Youngstown, O.  
 East Chicago Fdry Co., Chicago, Ill.  
 Garrison, A. Fdry Co., Pittsburgh, Pa.  
 Robinson-Rea Mfg. Co., Pittsburgh, Pa.  
 Seaman, Sleeth & Black, Pittsburgh.  
 Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.

#### Roofing.

Berlin Iron Bridge Co., E. Berlin, Conn.  
 Cambridge Roofing Co., Cambridge, O.  
 Cincinnati Corrugating Co., Piqua, O.  
 Kanneberg Roofing Co., Canton, O.  
 N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

#### Rope and Web Goods.

Covert Mfg. Co., West Troy, N. Y.  
 Covert's Saddlery Wks., Farmer, N. Y.

#### Rope Wheels.

Cresson, Geo. V. Co., Philadelphia, Pa.

#### Rubber Goods.

Canfield, H. O., Bridgeport, Conn.

#### Rules, Manufacturers of.

Keuffel & Esser Co., New York.  
 Lufkin Rule Co., Saginaw, Mich.  
 Stanley Rule & Level Co., 29 Chambers.

#### Rust Preventive.

Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.

#### Sand Paper.

Baeder, Adamson & Co., Phila., Pa.

#### Sash Balances.

Caldwell Mfg. Co., Rochester, N. Y.  
 Pullman Sash Balance Co., Rochester, N. Y.  
 Stearns, E. C. & Co., Syracuse, N. Y.

#### Sash Cords and Chains.

Morton, Thos., 45 Elizabeth, N. Y.  
 Ossawan Mills Co., Norwich, Conn.  
 Samson Cordage Works, Boston, Mass.  
 Smith & Egge Mfg. Co., Bridgeport.

#### Sash Locks.

Ives, H. B. & Co., New Haven, Conn.

#### Sash Pulleys.

Palmer Hardware Mfg. Co., Troy, N. Y.

#### Sash Weights.

Brown, E. E. & Co., Philadelphia, Pa.  
 Norton Bros., Chicago, Ill.

#### Saw Filing Machines.

Disston, Henry & Sons, Philadelphia, Pa.

#### Saws, Makers of.

Disston, Henry & Sons, Phila., Pa.  
 National Saw Co., 96 Reade St., N. Y.  
 Simonds Mfg. Co., Fitchburg, Mass.

#### Saw Vises.



- Allentown Rolling Mill, Allentown, Pa.  
Lockhart Iron & Steel Co., Pittsburgh, Pa.  
Passaic Rolling Mill Co., Paterson, N.J.  
Pottsville Iron & Steel Co., Pottsville, Pa.  
Roberts, A. & P. & Co., Phila., Pa.  
The Phoenix Iron Co., Phila., Pa.
- Shears and Scissors.**  
Acme Shear Co., Bridgeport, Conn.  
Heinrichs, R. Sons Co., Newark, N. J.
- Sheet Iron and Steel, Manufacturers of.**  
Aetna-Standard Iron and Steel Co., Bridgeport, O.  
Cambridge Iron & Steel Co., Cambridge, Ohio.  
Chess Bros., Pittsburgh, Pa.  
Mahoning Valley Iron Co., Livingston, Ohio.  
Morehead-McCleane Co., Pittsburgh, Pa.  
Piercion & Co., 29 Broadway, N. Y.  
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.  
The Mahoning Valley Iron Co., Youngstown, O.  
Alan Wood Co., Philadelphia.  
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Zinc.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Sinks.**  
Douglas, W. & B., Middletown, Conn.
- Skates, Ice.**  
Lovell, Jno. P. Arms Co., Boston, Mass.  
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Skates, Roller.**  
Henley, M. C., Richmond, Ind.  
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Smelting Works.**  
Reeves, Paul S., 760 S. Broad, Phila.
- Soldering Coppers.**  
Clendenin Bros., Baltimore, Md.  
Civert Mfg. Co., West Troy, N. Y.
- Speaking Tubes.**  
Ostrander, W. R. & Co., 204 Fulton St., N. Y.  
Wollensak, J. F., Chicago, Ill.
- Specialties, Pat. Articles.**  
Rhodes, L. E. Co., Hartford, Conn.
- Spelter.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.  
Missouri Metal Co., St. Louis, Mo.
- Spoons and Forks.**  
Boardman, L. & Son, New Haddam, Conn.  
Holmes & Edwards Silver Co., Bridgeport, Conn.  
Kelley & McBean, Niagara Falls, N. Y.  
Rogers, The Wm. Mfg. Co., Hartford, Conn.
- Sporting Goods.**  
Hartley & Graham, 313-315 B'way, N. Y.
- Springs.**  
Clark & Cowles, Plainville, Ct.  
Dunbar Bros., Bristol, Conn.  
Miller & Van Winkle, Brooklyn, N. Y.  
Morgan Spring Co., Worcester, Mass.  
Roland, Wm. & Harvey, Phila., Pa.  
Sabin Machine Co., Montpelier, Vt.  
Washburn & Moen Mfg. Co., Worcester, Mass.  
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
- Spring Hinges.**  
Bommer Bros., Brooklyn, N. Y.  
Chicago Spring Butt Co., Chicago, Ill.  
Pullman Sash Balance Co., Rochester, N. Y.  
Stover Mfg. Co., Freeport, Ill.  
Van Wagoner & Williams Hdw. Co., 14 Warren St., N. Y.
- Stamped Ware.**  
Am. Stamping Co., 104 & 106 John St., New York.
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Cleveland Stamping & Tool Co., Cleveland, O.
- Staples.**  
Cobb & Drew, Plymouth, Mass.  
Titchener, E. H. & Co., Binghamton, N. Y.
- Steam Gauges.**  
Bristol Co., Waterbury, Conn.
- Steam Hammers, &c., Makers of.**  
Dienelt & Eisenhardt, Philadelphia.  
Dugdon, Richard, 24 Columbia Street, N. Y.  
Tretlow Mfg. Co., Pittsburgh, Pa.
- Steam Heating.**  
Webster, Warren & Co., Camden, N. J.
- Steam Separators.**  
Goubert Mfg. Co., 32 Cortlandt St., N. Y.  
Harrison Safety Boiler Wks., Phila., Pa.  
Webster, Warren & Co., Camden, N. J.
- Steam Specialties.**  
Lunkenheimer Co., Cincinnati, O.
- Steel, Cold Rolled Strip.**  
Superior Steel Co., Pittsburgh, Pa.  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel Figures and Alphabets.**  
Krogsrud, W., 61 Fulton St., N. Y.
- Steel Importers.**  
Abbott, Wheelock & Co., N. Y. and Boston.  
Hobson, Francis, Seaman & Co., 97 John St., N. Y.  
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.  
Milne, A. & Co., 1 Broadway, N. Y.  
Newton & Shipman, 83 John, N. Y.  
Wetherell Bros., 93 Liberty St., N. Y.  
Whitney, A. R. & Co., B'way, N. Y.  
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Steel (Musher's Special).**  
Jones, B. M. & Co., Boston.
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Bethlehem Iron Co., S. Bethlehem, Pa.  
Borer, Hermann & Co., 103 Duane St. Carbon Steel Co., Pittsburgh, Pa.  
Chester Steel Castings Co., Phila., Pa.  
Chrome Steel Works, Brooklyn, N. Y.  
Crescent Steel Co., Pittsburgh, Pa.  
Frankford Steel Co., Philadelphia.  
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.  
Hobson, Francis, Seaman & Co., 97 John St., N. Y.  
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.  
Kayser, Ellison & Co., Sheffield, Eng. La Belle Steel Co., Pittsburgh, Pa.  
Lukens Iron & Steel Co., Coatesville, Pa.  
Morehead-McCleane Co., Pittsburgh, Pa.  
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Singer, Nimick & Co., Pittsburgh.  
Superior Steel Co., Pittsburgh, Pa.  
Valley Steel Co., Pittsburgh, Pa.  
Wordlaw, S. & C., Sheffield, Eng.  
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- Steel, Manufacturers' Agents.**  
Barns, C. K. & Co., Philadelphia, Pa.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Lindsay, Jas. G. & Co., Phila., Pa.  
Piercion & Co., 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.**  
Bethlehem Iron Co., S. Bethlehem, Pa.  
Cambria Iron Co., Johnstown, Pa.  
Montour Iron & Steel Co., Danville, Pa.  
Riverside Iron Wks., Wheeling, W. Va.
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La Belle Steel Co., Pittsburgh, Pa.
- Step Ladders.**  
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- Stocks and Dies.**  
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Billings & Spencer Co., Hartford, Conn.  
Butterfield & Co., Derby Line, Vt.  
Hart Mfg. Co., Cleveland, O.  
Saunders' Sons, D., Yonkers, N. Y.  
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Wiley & Russell Mfg. Co., Greenfield, Mass.
- Stove Linings.**  
Ostrander Fire Brick Co., Troy, N. Y.
- Stove Pipe Thimbles.**  
Cheney, S. & Son, Manlius, N. Y.
- Street Lamps.**  
Navy Gauge & Lantern Co., Syracuse, N. Y.
- Strops.**  
J. R. Torrey & Co., Worcester, Mass.
- Structural Iron Work.**  
Berlin Iron Bridge Co., East Berlin, Conn.  
Lindsay, Jas. G. & Co., Phila., Pa.
- Sulphuric Acid.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
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Atlas Tack Corporation, Boston, Mass.  
Clendenin Bros., Baltimore, Md.  
Cobb & Drew, Plymouth, Mass.  
Grand Crossing Tack Co., Grand Crossing, Ill.
- Taps and Dies.**  
Butterfield & Co., Derby Line, Vt.  
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.  
Manning, Maxwell & Moore, 111 Liberty St., N. Y.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Testing Laboratories.**  
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- Testing Machines.**  
Riehle Bros. Testing Mach. Co., Phila.
- Theatrical Hardware.**  
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- Thill Springs.**  
Frost Thill Spring Co., Boston, Mass.  
Sabin Machine Co., Montpelier, Vt.
- Timber and Mineral Lands.**  
Robertson, E. Co., Cincinnati, O.
- Time Record.**  
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- Tin Plate Machinery.**  
Lloyd Booth Co., Youngstown, Ohio.
- Tinware.**  
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- Tool Blocks.**  
Hulbut-Rogers Mch. Co., South Sudbury, Mass.
- Tool Chests.**  
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- Tool Holders.**  
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- Tools.**  
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Brown, R. H. & Co., New Haven, Conn.  
Mayhew, H. H. Co., Shelburne Falls, Mass.  
Millers Falls Co., 93 Reade, N. Y.  
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Stanley Rule & Level Co., 29 Chambers.  
Starrett, L. S., Athol, Mass.  
Wilkinson, A. J. & Co., Boston, Mass.
- Tools, Blacksmith and Wheelwright.**  
Buffalo Forge Co., Buffalo, N. Y.  
Butts & Ordway, Boston, Mass.  
Champion Blower & Forge Co., Lancaster, Pa.  
Plumb, Fayette R., Philadelphia, Pa.  
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- Torches, Oil and Gasoline.**  
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Schlader & Trenkamp Co., Cleveland, Ohio.  
Standard Lighting Co., Cleveland, O.
- Transom Lifters.**  
Wollensak, J. F., Chicago, Ill.
- Tricycles.**  
Toledo Metal Wheel Co., Toledo, Ohio.
- Trucks, Manufacturers of.**  
Clark, G. P., Windsor Locks, Conn.
- Tubes, Seamless Drawn Copper.**  
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.  
Randolph & Clowes, Waterbury, Conn.
- Tubes, Steel.**  
Leng's, John S. Son & Co., 4 Fletcher St., New York.  
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- Tumbling Barrels.**  
Henderson Bros., Waterbury, Conn.
- Turnbuckles.**  
Cleveland City Forge & Iron Co., Cleveland, O.  
Merrill Bros., Brooklyn, E. D.
- Twist Drills, Makers of.**  
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Morse Twist Drill & Machine Co., New Bedford, Mass.  
New Process Twist Drill Co., Taunton, Mass.  
Standard Tool Co., Cleveland.
- Valves, Gas, Water and Steam.**  
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Chapman Valve Mfg. Co., Boston.  
Eaton-Evans Mfg. Co., Philadelphia, Pa.  
Jenkins Bros., 71 John, N. Y.  
Lunkenheimer Co., Cincinnati, O.  
McNab & Harlin Mfg. Co., 56 John, N. Y.
- Ventilator Appliances.**  
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- Vise Jaws.**  
Newark Mch. Tool Co., Newark, N. J.
- Vises.**  
Athol Machine Co., Athol, Mass.  
Hollands Mfg. Co., Erie, Pa.  
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Millers Falls Co., 93 Reade St., N. Y.  
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- Washers.**  
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- Water Wheels.**  
Poole, Robt. & Son Co., Baltimore, Md.
- Wheelbarrows.**  
Amer. Steel Scraper Co., Sidney, Ohio.  
Byran Mfg. Co., Byran, Ohio.  
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.  
Sidney Steel Scraper Co., Sidney, O.
- Window Cleaners.**  
Bourke Mfg. Co., Youngstown, O.
- Window Cord, Makers of.**  
Samson Cordage Works, Boston, Mass.
- Wire, Manufacturers of.**  
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.  
Miller & Van Winkle, Brooklyn, N. Y.  
New Castle Wire Nail Co., New Castle, Pa.  
New Haven Wire Mfg. Co., New Haven, Conn.  
Salem Wire Nail Co., Salem, O.  
Trenton Iron Co., Trenton, N. J.  
Washburn & Moen Mfg. Co., Worcester.  
Wetherell Bros., 93 Liberty St., N. Y.  
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.  
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cloth.**  
Barnum, E. T., Detroit, Mich.  
Clinton Wire Cloth Co., Clinton, Mass.  
Darby, Edward & Sons, Philadelphia.  
Estey, W. S., 65 Fulton, N. Y.  
Gilbert & Bennett Mfg. Co., 42 Cliff.  
Howard & Moen, 45 Fulton, N. Y.  
N. J. Wire Cloth Co., Liberty St., N. Y.  
Scheeler & Sons, Buffalo, N. Y.  
Wickwire Bros., Cortland, N. Y.  
Wright & Colton Wire Cloth Co., Worcester, Mass.  
W. S. Tyler Wire Works Co., Cleve'd.
- Wire Cutters.**  
Higman Hdw. Co., Higmanum, Conn.  
King, J. M. & Co., Watertown, N. Y.
- Wire Dies.**  
McFarland, Wm., Trenton, N. J.  
Newton & Shipman, 83 John St., N. Y.
- Wire Fences, See Fencing, Iron and Wire.**
- Wire Goods, Manufacturers of.**  
Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.  
Darby, Edward & Sons, Phila.  
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.  
Ludlow-Saylor Wire Co., St. Louis.  
Ossawan Mills Co., Norwich, Conn.  
Scheeler & Sons, Buffalo, N. Y.  
Wickwire Bros., Cortland, N. Y.  
Williamson, C. T., Wire Novelty Co., Newark, N. J.  
Wire Goods Co., Worcester, Mass.
- Wire Machinery.**  
Am. Tool Wks., Cleveland, O.  
Manville, E. J. Mch. Co., Waterbury, Ct.  
Morgan Construction Co., Worcester, Mass.  
Waterbury Mch. Co., Waterbury, Conn.
- Wire Straightening and Cutting Machinery.**  
Adt, John & Son, New Haven Conn.
- Wire Nails.**  
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Indiana Wire Fence Co., Crawfordsville, Ind.  
Kilmer Mfg. Co., Newburg, N. Y.  
New Castle Wire Nail Co., New Castle, Pa.  
Phillips, Townsend & Co., Phila., Pa.  
Salem Wire Nail Co., Salem, O.  
Taunton Wire Nail Co., Taunton, Mass.  
Whitney, A. R. & Co., New York City.
- Wire Rods, Steel.**  
New Castle Wire Nail Co., New Castle, Pa.  
Washburn & Moen Mfg. Co., Worcester, Mass.  
Whitney, A. R. & Co., 17 B'way, N. Y.  
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
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California Wire Works, San Francisco.  
Hazard Mfg. Co., Wilkesbarre, Pa.  
A. Leschen & Sons Rope Co., St. Louis.  
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Washburn & Moen Mfg. Co., Worcester, Mass.  
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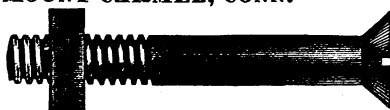
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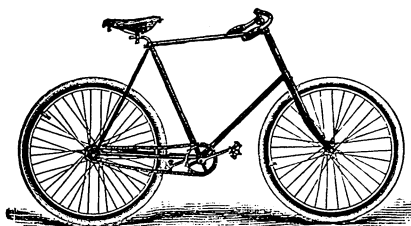
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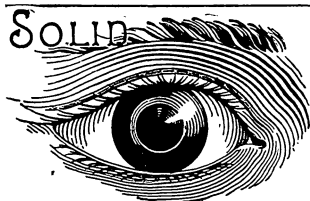


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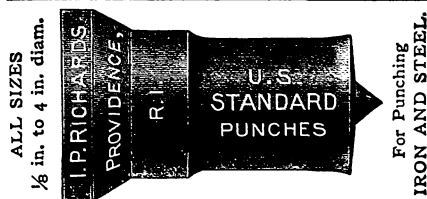


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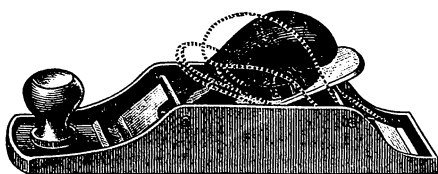
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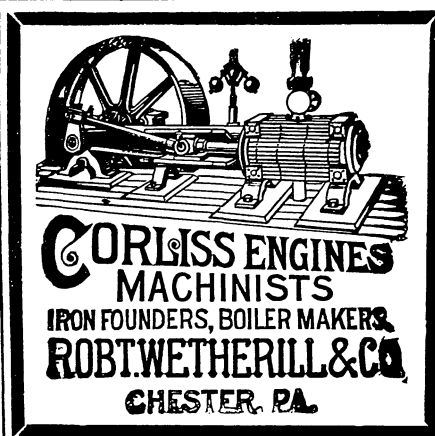
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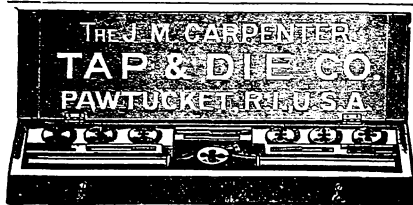
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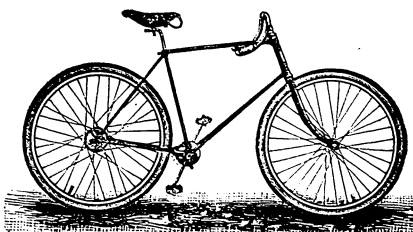


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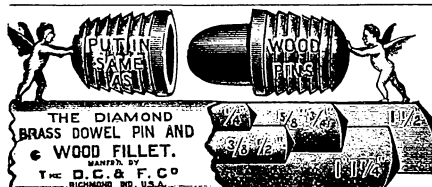
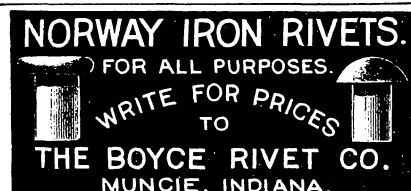


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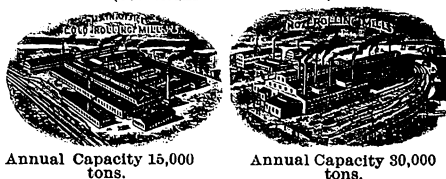
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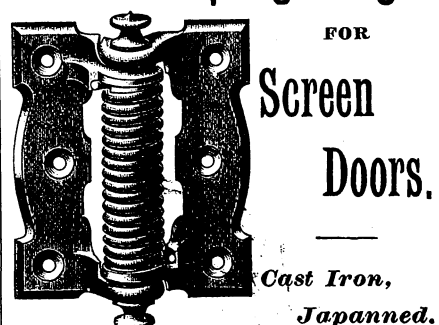
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# THE IRON AGE

THURSDAY, APRIL 26, 1894.

## The Barr Compound Non-condensing Pumping Engines.

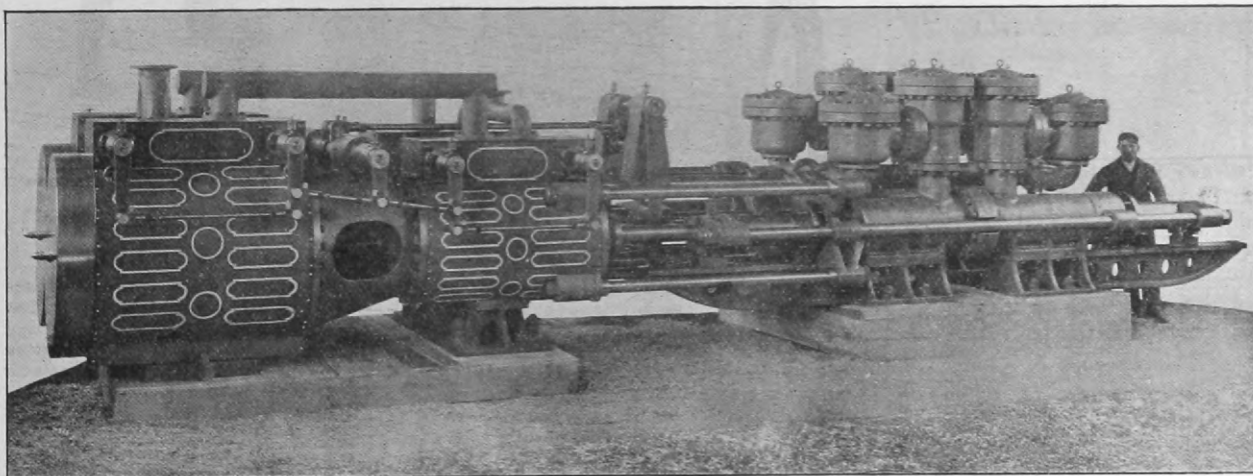
The Barr Pumping Engine Company of Philadelphia have recently designed and erected for the new Bessemer steel plant of the Ohio Steel Company, at Youngstown, Ohio, three compound non condensing pressure pumping engines, for serving the hydraulic machinery of the plant, the general features of which are shown in the accompanying illustrations. These pumping engines are of special design, adopted after careful consideration of the conditions of service under which they are to be operated and are of an exceptionally high grade class of machinery.

There is probably no more severe service to which pumping machinery

steel plants that, while no effort has been spared to introduce in other features machinery of the highest class, the question of economy in the pumping plant, not the smallest feature of the whole by any means, has been disregarded. Anything seems to be considered good enough.

In the subject of the present article great care has been given to an elaboration of detail by which the greatest economy of operation for this class of pumping engine may be obtained while conserving the merits of the simple and strong type of construction. The engines described are three in number, and have a maximum capacity of 400,000 gallons of water delivered per hour, under a pressure of 1000 pounds per square inch. The high pressure cylinders are 24 inches in diameter, the low pressure cylinders 40 inches in diam-

valve chamber to the exhaust chest. The steam contained in the cylinder back of the exhaust port is exhausted more or less slowly through the cushion ports, thus forming a cushion at the end of the stroke. The connection between the valve and valve gear is through a gun metal stem provided with a tee head. The bonnet and stuffing boxes are of the Corliss type. The steam piston rods are made of hammered crucible steel, and are continuous between the cross head and low pressure piston. They are 5½ inches in diameter between the cross head and the high pressure piston, and between the high and low pressure pistons they are 4½ inches in diameter. They are connected to the pistons and cross heads with straight fits, the shoulders being reinforced with steel collars. They are secured to the cross heads by forged steel keys and to the pistons by



THE BARR COMPOUND NON-CONDENSING PUMPING ENGINES.

can be put than in the ordinary demands of steel works, where at one moment the full maximum capacity of the plant may be demanded, and almost instantaneously the stoppage of the various motors brings the pumping machinery to a sudden standstill. Added to this is the possibility of an accident, which may occasion to the parts subjected to water pressure a blow equal in force to many times the strains which have to be provided for under the normal conditions of service. It therefore becomes the duty of the designer of this class of machinery to build such an engine as is, in the first place, essentially strong in all its parts and with a large factor of safety for strength, and which, in the second place, possesses the greatest durability of the working parts. The difficulties resulting from a breakdown of a pumping plant in a steel works are too serious to be disregarded; simplicity of construction and durability of parts is, therefore, a feature of considerable moment. In the great majority of instances, however, economy of practice has been sacrificed to the desire on the part of the designer to simplify and cheapen construction. The average pressure pumping engine is not a work of engineering skill, and we see in many of our comparatively modern

eter. They are arranged in tandem pairs, with the low pressure cylinders outside. They are made of a special and carefully selected mixture of charcoal irons of close texture and high tensile strength, and are of sufficient thickness for reborring. The high pressure cylinder is fitted with two cushion valves in each end, the low pressure cylinders with one in each end. The office of these valves is to permit the passage of steam from the steam to the exhaust ports at the end of the exhaust stroke, and by their regulation the amount of steam cushion or exhaust release at the end of the stroke may be varied to suit the working conditions. The steam pistons are fitted with followers and metallic packing rings of segmental form. These packing rings are set out with elliptical springs and require no adjustment to keep them tight. The pistons are provided with set screws and pads on the bottom for keeping them central with the cylinders and to compensate for wear on the junk ring. The steam valves are of the rotary type, one in each end of each cylinder, the cylinder being double ported, as shown in the sectional engraving. Steam is admitted to the cylinder through the outside port direct and exhausted through the inside port and

forged steel nuts. All the steam stuffing boxes and glands have bushings of United States gun metal, and all the joints of the steam end are made with soft copper gaskets. The steam cylinders are neatly lagged with a paneled lagging of cast iron secured to the flanges of the cylinders with screws. Between this lagging and the cylinder and chest walls the space is filled with magnesia to prevent radiation.

The intermediate pieces between the high and low pressure cylinders form the inside heads for the cylinders, and carry the stuffing boxes for the piston rod. They are of conical form, as shown, with suitable provision for convenient access to the stuffing boxes, and are strongly ribbed and braced. The outside low pressure cylinder head is of ribbed form, and is covered with a polished cast iron cap, secured with acorn nuts. The inside heads of the high pressure cylinders are turned and polished, and carry the stuffing boxes for the piston rods. The high pressure cylinders are bolted to the foundation on heavy cast iron feet, to which they are secured. The low pressure cylinders simply rest upon a foot of cast iron, which is bolted to the foundation. By this means provision is made for the expansion and contraction of the inter

mediate parts. The steam and exhaust chests of both high and low pressure cylinders are cast with the cylinders. The steam pipe is of Y form, connecting the high pressure chests with the throttle valve. The connecting pipes between the high and low pressure cylinders are of cast iron.

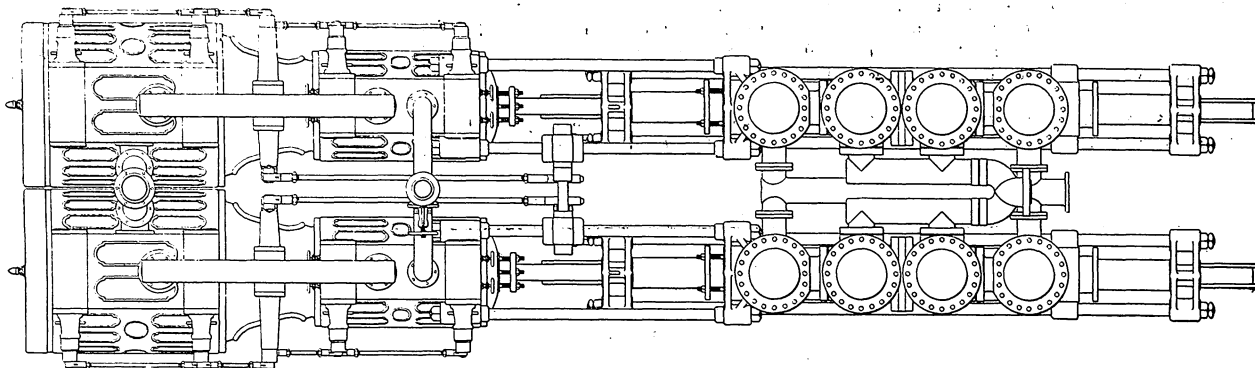
The valve gear is of the standard duplex form of the Barr Pumping Engine Company. All the pins of this gear are of hardened steel. The stubs of the valve rods are fitted with half boxes for taking up the wear and are made of United States gun metal. The valve connecting rods are of steel, and ample provision for convenient adjustment of the length of the valve rods is made. The valves of each pair of cylinders are operated through the medium of an intermediate rock shaft, which receives

weight of the plungers, through the medium of gun metal slippers provided with wedges for convenient adjustment.

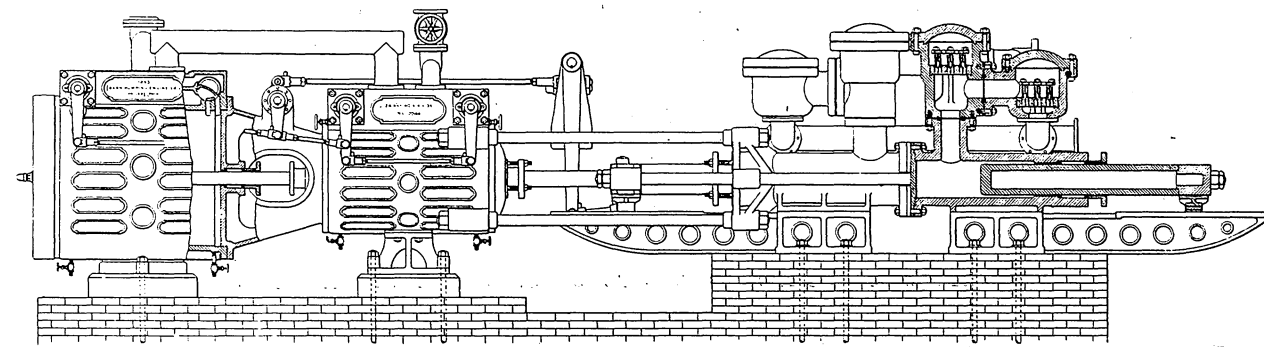
The valve chambers are made of a special mixture of charcoal irons, cast from an air furnace. Each pump is furnished with four suction and four discharge chambers of pot form. The valve plates are of solid United States gun metal secured within the chambers with brass studs and nuts. Each chamber contains seven  $2\frac{1}{4}$  inch valves of special design, also made of gun metal. All the joints of the water end, with the valve seats, are of the ring flange pattern, and the bolting is most liberal. Twenty-two 2-inch foundation bolts secure each engine to its foundation. The total weight of each engine is 90,000 pounds. The finish of the en-

been out of blast for about three years, but was started early in April. It is cold blast, and the product is about 14 tons per day, but it is expected that this will be increased to 16 or 17 tons. The sole selling agency has been placed in the hands of Rogers, Brown & Co. and their branch houses. The iron is held at a figure above the price of ordinary car wheel brands, but no higher than the best cold blast charcoal.

The annual meeting of the Iron and Steel Institute will be held in London on May 2 and 3. The following papers will be read and discussed: "On the Physical Influence of Certain Elements Upon Iron," by A. O. Arnold; "On the Analysis of Steel," by H. K. Bamber; "On the Capacity and Form of Blast Furnaces," by William Hawdon;



Plan.



Sectional Side Elevation.

#### THE BARR COMPOUND NON-CONDENSING PUMPING ENGINES.

its motion from the main rock shaft, through central valve rods.

The frame of each engine consists of eight tie bars, four on each side, which are secured to bosses, cast on the steam and water cylinders. These tie bars are  $3\frac{1}{4}$  inches in diameter, and are turned and polished, with steel collars reinforcing the shoulders. The water cylinders are cast in four separate pieces for each pump and are of the best homogeneous open hearth steel castings, having a general thickness of  $2\frac{1}{4}$  inches. The central heads are likewise made of steel and are fitted with double shoulder joints. The plungers are of cast iron and the plunger cross heads of cast steel. The plunger stuffing boxes and glands are bushed with United States gun metal. Parallel rods connect the inside and outside plungers and are of steel,  $2\frac{1}{4}$  inches in diameter. The cylinders are carried on feet of cast iron, which are bolted to the foundation and form slides for supporting the

engines in their entirety is of the highest class, and no effort has been spared to make the entire plant the most modern in existence. The plant of the Ohio Steel Company is an entirely new one, and is constructed under designs of Julian Kennedy of Pittsburgh.

The historic Round Mountain Furnace has passed into the possession of a new company called the Round Mountain Furnace Company, with headquarters at Chattanooga. L. S. Colyar, who has been connected with iron interests in the South for many years, is president. The furnace is located at Round Mountain, in Alabama, and during the war it was run to make iron for cannon for the Confederate Government. After the war it was idle for many years, but it was put into operation and gained a reputation for use in chilled rolls and similar work requiring great strength. It has

"On Scandinavia as a Source of Iron Ore Supply," by Jeremiah Head; "On the Application of Electricity as a Motive Power in the Iron and Steel Industries," by D. Selby-Bigge; "On the Walrand Process," by G. J. Snelus; "On Methods of Preparing Surfaces of Iron and Steel Microscopic Examination," by J. E. Stead; "On the Relations Between the Chemical Constitution and Ultimate Strength of Steel," by W. R. Webster.

Witherbee, Sherman & Co. of Port Henry, N. Y., have posted notices stating that work in the firm's mines will cease on May 1.

The speedy new triple screw cruiser "Columbia" goes into commission at Philadelphia this week. She will be sent to the New York navy yard for the completion of her equipment, after which the vessel will be ready for active service.



## American vs. European Basic Bessemer Steel.

BY J. B. NAU, ALLEGHENY, PA.

The question of making basic steel in this country, since the time that Southern ore and coal fields have become better known, has been discussed in a number of articles published in different trade papers of the United States. Its importance has still further increased since the patents covering the basic Bessemer process have expired and will in no way interfere with the development of this branch of industry in those parts of the country where all the raw materials can be gathered together to successfully introduce it.

Sometime ago a paper, contributed by Mr. Tordeur to the *Revue Universelle des Mines*, on the manufacture of basic steel in Belgium, was taken up by and very ably discussed in *The Iron Age*. In this discussion the writer, as could be expected, carefully established the probable cost prices per ton of basic steel in this country, and established a comparison between the American and Belgian cost prices.

Nearly at the same time that Mr. Tordeur's paper was published in the *Revue Universelle des Mines*, another paper of similar importance had been presented by Mr. Palgen before the *Ingénieurs sortis de l'Ecole de Louvain*. In this paper also the author establishes with all the necessary details the cost price per ton of basic steel; but, while Mr. Tordeur makes a comparison between the cost prices that can be obtained in different coal centers in Belgium working with Luxembourg phosphoric ores and the prices obtained in some well known concerns located right in the Luxembourg and eastern French ore districts, Mr. Palgen on the contrary limits himself to the establishment of a more general cost price for Belgian works running with Luxembourg ores. But both prices are established with great care as to details and itemized costs, and while there may be some slight differences between some of the items, the general cost prices arrived at are pretty nearly the same. In his paper Mr. Palgen describes at great length two well known steel works (Hayange and Jœuf). Both of these works are located in the same region or ore belt as Dudlingen and Longwy, and the conditions as to character and costs of raw materials as well as to costs of labor and other expenses are pretty nearly the same in the four works. All of them have the most modern improvements. They all have been built from 1879 to 1882, after the Thomas process had been successfully experimented with.

It is not my intention to subject the figures submitted by Messrs. Palgen and Tordeur to a minute examination. Nevertheless I will call the attention to such of these figures that have been especially considered in *The Iron Age* in the paper "Basic Bessemer Costs." It will suffice to say that according to my knowledge most of the figures taken from these reports are as correct as can be expected, and that the total cost prices established are very near the truth. As already stated, the conditions at Dudlingen and Longwy are very nearly the same as those of Hayange and Jœuf. These two last works are particularly well known to me, since it is at Hayange that, together with Mr. Palgen, I had my first experience in 1881

in the manufacture of basic steel, and a little later on was sent from there to take charge as superintendent of the works at Jœuf, in France, that belong practically to the same company.

I will give here in a few brief words some information as to the most important points regarding the labor paid and number of men employed, because some of these items have been spoken of in the article published in *The Iron Age*, already referred to. The average labor that we used to pay on our work was about equal to the figures stated in Mr. Tordeur's paper. At first this labor was paid in daily wages, but in order to stimulate the men it was decided to pay them a premium of 5 per cent. of their daily wages if a certain number of heats were obtained in 12 hours, and to increase this premium to as high as 30 per cent. of their wages if the heat reached a number at that time considered the maximum to be obtained there. After a short while, however, when some appliances had been improved, we regularly made more heats and the prices were changed to regular tonnage prices, more satisfactory to everybody. The establishment of this tonnage price was based on the fair daily wages for a man.

The number of men per shift is given in Mr. Tordeur's paper as 88. In one of the works of the Luxembourg-Lorraine district the number amounted to only 73, but the following were not included: Engineer and fireman of iron ladle locomotive and engineer at b'ower engine, firemen at boilers, oiler, men handling ingots not at casting pit, and dolomite cupola men. The list included six pig iron and coke wheelers for iron cupola. When we were running direct from the blast furnace, which mostly was the case, these men dropped out. Sometimes the cupola was partly used. It also includes all the day labor required in the converting mill, as well as masons, bricklayers on cupola and ladle, and the men employed at the dolomite grinding mills and the tar and dolomite mixers. It furthermore excludes the number of men required to unload the raw material. Two men per shift were required to haul the lime used in the converters. In order to save labor on this item, in one of the steel works the lime is unloaded from cars standing on a trestle directly into bins or large boxes below the trestle. In this manner no lime is wasted, and the lime service is done in the cheapest possible way.

The lime we used in our works came from Belgium generally. It contained on the average about 1 per cent. of silica. We at one time received it from two different Belgian firms. In the beginning we paid for it 8 francs (not quite \$1.60) a ton of 2204 pounds, f.o.b. cars at the seller's place in Belgium. Later on, however, we paid not more than \$1.40 a ton at one place and only \$1.25 at the other place. But after having added to this the freight rate, which covered a rather long distance, this lime came as high as 17.11 francs (say less than \$3.40) a ton. A still later price that we paid for this same lime was 15.45 francs (say \$3.09), f.o.b. cars at our place. The figure of \$1.60 quoted by Mr. Tordeur as being the price of 1 ton of lime at Charleroi is, therefore, undoubtedly correct. The lime was perfectly well burnt and, as already stated, mostly of excellent quality.

The dolomite used in Hayange as well as in Jœuf had in its raw state the following composition: Lime, 29.920; magnesia, 19.810; alumina, 0.880;

oxide of iron, 1.170; phosphoric acid, 0.270; silica, 1.280; sulphur, 0.027; loss by calcining, 46.600. If this composition be compared with the composition of a chemically pure dolomite as quoted in the article "Basic Bessemer Costs" in *The Iron Age* of December 21, 1893, it will be found that it constituted a stone of remarkable purity.

The dolomitic stone was shipped over a distance of about 40 miles (a little more or less) to Hayange, where it was burnt in a cupola built for that purpose. As the manner in which this is done is undoubtedly of importance I append here a summary description of the operation. The cupola used was 22 feet high from bottom to charging door and about 5 feet 7 inches diameter, with straight cylindrical lining. From about 2 feet from the bottom to nearly 3 feet from the top this lining was made of burnt dolomite. At different heights openings were kept in the brick work through which by means of iron bars the raw dolomite was shaken in order to make it fall down, should some hanging occur. At the bottom several doors had been placed all around through which the burnt dolomite was removed. A bustle pipe placed at a certain height and provided with four tuyeres received the blast from a blower. The pressure of the blast is extremely light, as it is important that the stone should descend slowly and be completely burnt before it reaches the lower region.

When the coke used in the operation is of good quality 20 per cent. of it will do, but if of inferior quality it is advisable to add about 25 per cent. of the weight of the raw dolomite. The stone descending slowly will begin to cool after it has passed the region of the tuyeres, and by the time it reaches the bottom of the cupola it will have become cold enough to be removed by hand. With a little practice the man in charge of the cupola will soon become an expert in sorting the dead burnt stone from the insufficiently burnt part. The latter is returned to the cupola. Before being charged in the cupola the stone must be broken to the right size. The dead burnt dolomite must be used as quickly as possible. At any rate it must be stored, if such be the case, in a dry space and be shipped in a closed car. Three men are required per shift of 12 hours to run the cupola. These men are paid from 3.50 to 4 francs per day (70 cents to 80 cents). In 12 hours such a cupola can burn from 3 to 4 tons. With some precaution even 5 to 6 tons can be burnt without increasing the number of men.

In his paper Mr. Palgen itemized the price of ground dolomite per ton mixed with tar, and found that it would amount to about \$10 per ton. This may have been the price of that material at the beginning, but the writer knows that later on it was considerably lower than that. We do not propose, however, to discuss it here, as it is of lesser importance, and certainly will not change materially the general cost price of the ingot steel.

Now that we have gone over some of the figures that may have given some doubt, we shall come to the general cost price. Mr. Palgen in his paper arrives at a general cost price of \$13.61 per gross ton of 2240 pounds. Mr. Tordeur establishes prices for four different regions, and comes to the following conclusions:

|            |         |           |         |
|------------|---------|-----------|---------|
| Charleroi. | Liege.  | Dudlange. | Longwy. |
| \$14.19    | \$13.86 | \$12.40   | \$13.25 |

We consider here only the prices that are obtained from Mr. Tordeur's last table, based on prices for raw materials

for the year 1892. The prices of this table being on the average about \$1 lower per ton than those given in his first table based on higher price for raw material, will be more liable to enter in competition with prices obtained in this country. The average of the four prices

coke, &c., in order to find out how the raw materials of the South will compare to them.

Ores.—The appended table gives some information about the composition of the ores used in the basic steel works of that region:

Table I.

|                       | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Silica .....          | 8.40  | 11.75 | 5.10  | 6.40  | 5.60  | 6.78  | 17.21 | 16.20 | 10.60 | 4.50  | 12.60 |
| Alumina .....         | 6.86  | 4.75  | 3.5   | 5.76  | 3.33  | 4.27  | 6.61  | 9.50  | 9.10  | 6.60  | 8.00  |
| Lime .....            | 11.80 | 17.70 | 22.50 | 30.10 | 29.00 | 17.74 | 5.67  | 4.80  | 10.00 | 23.00 | 8.50  |
| Iron .....            | 36.42 | 30.90 | 31.21 | 20.40 | 23.28 | 33.56 | 37.61 | 37.10 | 36.50 | 27.60 | 36.50 |
| Magnesia .....        | 1.31  | ...   | 1.21  | 1.74  | 1.27  | 1.43  | 1.61  | ...   | 1.46  | 1.24  | ...   |
| Phosphoric acid ..... | ...   | ...   | 1.23  | ...   | ...   | ...   | ...   | ...   | ...   | ...   | ...   |

of Mr. Tordeur's table is \$13.42, very nearly the same as that established by Mr. Palgen, who gives \$13.61 per ton of 2240 pounds. The lowest price is the one obtained at the works at Dudlange, and the next lowest price is the one at Longwy. Both works are located in what we may call the ore belt region of Luxemburg-Lorraine, at some 25 miles distance apart by rail. But while Dudlange is located in the Grand Duchy of Luxemburg, Longwy is located in France. Both works are working under nearly the same conditions as to raw materials and labor, Dudlange, however, having probably the advantage in regard to ore.

Charleroi and Liege are well known coal centers in Belgium. Liege especially has a favorable location on account of the river Meuse, which enables it to ship the product at once per water. Both Liege and Charleroi, if working well the basic process, will be supplied with ores from the ore belt region of Luxemburg-Lorraine, while Dudlange and Longwy, located in this region, receive a large part of their fuel from Charleroi and Liege. This is especially true for Longwy.

Since it is the aim of this paper to establish a comparison between the prices of steel from the European works mentioned and the prices of basic steel made in some of our Southern States, with the view to ascertaining how far European basic steel can compete with domestic basic steel, it is necessary that we should know how much a ton of steel from either of the four regions mentioned would cost f.o.b. steamer at the port of Antwerp. This port is the only one from which the concerns mentioned would ship their products, with probably the exception of Liege. The works of Dudlange, where the lowest price is obtained, are located at a roughly estimated distance of 170 miles from Antwerp. Longwy may be some 25 miles nearer, while Charleroi is probably not more than 55 to 60 miles by rail from the same port. Steel ingots shipped from Dudlange, after having added railroad freight, loading and unloading expenses, would cost undoubtedly in the neighborhood of \$14.20 a ton, f.o.b. steamer Antwerp, while the same product shipped either from Charleroi or Longwy will cost more than that. Liege also, though probably another route will be followed here, can be said to be in nearly the same condition. The price of \$14.20 a ton of basic steel, f.o.b. steamer Antwerp, may then be considered as a fair starting point to make this comparison.

Before speaking of the price at which basic steel can probably be made in the South, it is necessary to say something about the raw materials used in the European works mentioned, the analysis of the ores, the quality of the

The above table has been taken from a series of analyses covering nearly the whole ore belt region of the Luxemburg and partly the Lorraine basin. Compared with our American ores used in Northern furnaces they are poor, and most of the American ironmasters would consider them hardly fit to be put into a blast furnace. The phosphorus is nearly constant, as can be seen by the few analyses quoted. The analyses, as quoted in the above table, are not complete. All the ores contain a rather high percentage of water and also some sulphur. The sulphur contents are high enough to give a rather high percentage of that element to the pig iron when no special precautions are taken in the blast furnace. Sometimes as high as 0.3 per cent. of it is found in the iron made from

contents they are not fit to be used for basic Bessemer pig without admixture of some manganese ores. This was especially the case a few years ago when no cheap method had yet been invented to remove sulphur from the pig. But since the invention of the Hoerde desulphurization process so-called Thomas pig iron without manganese, or with a smaller percentage of it, can be made, from which the sulphur is removed later. The manganese ores are brought by rail to the region mostly from Nassau, Germany, or from Belgium. Average analyses of these two ores are given below:

| Nassau.                             |   |                      |                        |                        |
|-------------------------------------|---|----------------------|------------------------|------------------------|
| SiO <sub>2</sub> Per cent. 10 to 11 | Al <sub>2</sub> O <sub>3</sub> Per cent. 2 to 3 | CaO Per cent. 6 to 7 | Fe. Per cent. 30 to 31 | Mn. Per cent. 16 to 20 |
| Belgium.                            |   |                      |                        |                        |
| 30 to 31                            | 5 to 6  | .....                | 20 to 21               | 16 to 17               |

Generally from 5 to 8 per cent., in some cases even 10 per cent., of manganese ores are added to the burden in the blast furnace. Of course only as little as possible of this ore is added on account of its high price. For a Nassau ore containing on the average 20 per cent. of Mn, that we used mostly in our works, we paid about \$5 a ton, f.o.b. cars at the works. Five per cent. of this ore was added to the burden.

The average of iron contained in the Luxemburg-Lorraine ores may be taken as being about 33 per cent.; the yield in the blast furnace about 31 to 33 per cent. From a table in my possession the following figures are taken:

Monthly Report from One Works of that Region for Three Different Months.

|   |                 |                |                 |
|---|-----------------|----------------|-----------------|
| Total amount of ore required.....                         | 18,900 tons.*   | 18,895 tons.*  | 19,756 tons.*   |
| Total amount of pig made.....                             | 6,024 tons.     | 6,036 tons.    | 6,140 tons.     |
| Total amount of coke.....                                 | 5,884.57 tons.  | 6,053.70 tons. | 6,060.06 tons.  |
| Average yield of ore in iron.....                         | 31.87 per cent. | 32 per cent.   | 33.08 per cent. |
| Average consumption of coke per ton of iron produced..... | 0.97 ton.       | 1.003 tons.    | 0.987 ton.      |

\* Metric tons of 2,204 pounds.

these ores. Most of the ores also contain manganese oxide in sufficient quantities to put 0.2 to 0.4 per cent. into the pig. On account of their high percentage of lime and other fluxing elements they can be so burdened that no additional flux is required. But in some blast furnaces of the region a small amount of calcite, generally quarried not very far from the furnace, is added to the burden. In some other regions of the same ore belt the ores carry as high as 20 to 25 per cent. of silica. They are, however, avoided in the blast furnaces as much as possible.

The above table shows a pretty fair average analysis of the ores not only from the Luxemburg region, but from Lorraine and Eastern France as well. They are mostly found in horizontal layers in the chains of hills that rise above the general level of the valleys. Three to four veins generally lie above one another, separated by several feet of rock. These veins vary in thickness from 1 foot to as high as 20 feet. In many cases the ores are taken out in open quarries. This was especially the case some 10 to 15 years ago, and is still done to day when the amount of stripping is not too expensive to remove. Mostly, however, they are taken out in drifts run right into the veins, and in many cases heavy timbering is required. In most cases they are mined at less than 40 cents a ton of 2204 pounds. At times, when prices were low, the writer remembers that they have been sold at 42 cents a ton, f.o.b. car at the mine. But on account of their sulphur

Coke.—In spite of the low yield of iron, or the poor iron ores, the consumption of coke is about equal to 1 ton of coke to 1 ton of pig iron. It must, however, be stated that the iron produced is mostly white mottled iron. When foundry iron is produced the fuel consumption is higher. When Thomas iron is made the consumption of coke is a little higher, because then a higher temperature is required in the blast furnace, in order to eliminate as much sulphur as possible. The average of the coke consumed in certain works, per ton of pig iron produced, amounted to 1.13 per cent. This would make 2260 pounds of coke per short ton of pig iron. To-day, however, it is generally less. The item of coke constitutes the greatest factor in the cost price of pig iron in those works. No coal is found in the Luxemburg ore region. All the fuel used comes from either Belgium or Germany. In one works in that district the ton of coke, several years ago, cost \$5.24, f.o.b. car at furnace. The cost price per ton of basic Bessemer at that time was \$10.02. The consumption of coke was 113 per cent. per ton of pig, and, consequently, it cost \$5.92 per ton of pig. This shows that more than one-half of the cost price of the pig is due to the fuel used in the blast furnace. The coke generally contains about 1 per cent. and sometimes even more of sulphur, while the ash amounts to about 10 per cent. In all other respects it is good blast furnace coke, of a generally even quality.

**Pig Iron.**—It is hardly necessary to speak much of the pig irons that are obtained from the raw materials mentioned. The analysis of the ores indicates it sufficiently. Generally the pig iron contains from 1.7 to 2 per cent., and sometimes a little more, of phosphorus.

As far as the writer knows, no attempt is made, at least in any of the works located in the ore belt, to increase the percentage of phosphorus in the pig iron beyond that naturally due to the phosphorus contents of the ore. In some of the German works, where a large amount of Luxemburg ores are converted, the phosphorus in the pig iron often reaches 2.5 per cent., and even as high as 3 per cent. This may be due, however, more to the fact that at those works puddle cinder constitutes one of the raw materials used in the burden of the blast furnace. Puddle cinder, when it is the result of a treatment of phosphorous pig iron—the class of iron that is largely used in German and Belgian puddle mills—is always rich in phosphorus. It is advantageous to German works that have to buy their ores in Luxemburg and pay a high freight to ship them to their works, to make use of the puddle cinder that may be at hand or that they can secure at a rather low price, considering the amount of iron it contains.

With the exception of the group of the de Wendel's iron works, which, if I remember well, operated at one time as many as 80 and more puddling furnaces, only a very limited number of puddling furnaces existed in the whole Luxemburg region. Consequently very little puddle cinder is to be found there. Now, since pig iron, which naturally will contain from 1.7 to 2 per cent. of phosphorus, has been found to constitute an excellent basic iron, as far as phosphorus alone is concerned, there is no reason to increase the percentage of that element by the addition of higher priced puddle cinder. Many people still believe that a basic pig iron must contain from  $2\frac{1}{2}$  to 3 per cent. of phosphorus in order to give good results in the converter and this solely for the reason that in some well known German basic steel works the pig iron actually contains that amount of phosphorus. It is more probable that the German metallurgical engineers, who generally know what they are about, favor a percentage of  $2\frac{1}{2}$  to 3 per cent. of phosphorus in the pig because in their own district such a pig iron is the result of the cheapest burden in the blast furnace. If with a pig iron containing from 0.3 to 1 per cent. of silicon it is found that very good results can be obtained in the converter when 1.7 to 2 per cent. of phosphorus enter into its composition, it is unnecessary to try to increase the phosphorus content, because then a larger amount of lime is necessary in the converter to remove it. And we may say here, "Lime is money." In the whole Luxemburg district, as well as in Lorraine and in Eastern France, where the same ores are found, the average composition of a basic Bessemer iron may be given as follows: Silicon, 0.3 to 1 per cent.; manganese, 1.5 to 2 per cent., and phosphorus, 1.7 to 2.3 per cent. The presence of manganese is necessary for different reasons: It is a powerful means by which the sulphur can be reduced in the blast furnace. It also helps considerably to increase the initial temperature of the bath in the converter, especially when the silicon of the iron is at its lowest limit. Though it is advisable that this element should not be lower than given above,

there are cases, however, where it is lower, as will be seen in the following table taken from *Stahl und Eisen*:

Table II.—Analyses of Basic Pig Iron.

|            | C.   | Si.  | Mn.         | P.          | S    |
|------------|------|------|-------------|-------------|------|
| Longwy...  | 0.35 | 1.80 | 2.1 to 2.25 | 0.05        |      |
| Angleur... | 1.00 | 1.50 | 2.0         | 0.05        |      |
| Hoerde...  | 3.60 | 0.58 | 1.37        | 2.75        | 0.08 |
| Phoenix... | 2.80 | 0.20 | 1.8 to 2.3  | 2.0 to 2.40 | 0.05 |
| Peine...   | 3.60 | 0.60 | 2.25        | 2.70        | 0.05 |
| Kladno.... | 0.44 | 0.40 | 2.0         | 0.03        |      |

In this table the manganese content of the pig iron used at Kladno is only 0.40, but its sulphur is very low. In the Luxemburg pig iron the sulphur is naturally pretty high when only native ores are used. It would be too high at any rate to constitute only a fairly good basic iron. The sulphur, as is well known, ought to be lower than 0.1 per cent. in this class of iron. The pig irons of Table II are all much lower in sulphur.

The figures here quoted give a fair idea of the raw materials used in that district. In the Belgian districts mentioned in Mr. Tordeur's paper the same ores are used, but their price, as well as the price of pig iron made from them, is considerably higher on account of the freight on a 60 to 100 mile haul on ore. The differences in the prices of the pig iron made in the Luxemburg district and Belgian pig iron is well illustrated in Mr. Tordeur's paper. Pig iron at Dudlange is quoted at \$9.30 a metric ton, while at Charleroi it is as high as \$11.09.

(To be concluded.)

#### Business in Central Ohio.

There is no enthusiasm but many signs of improvement in iron trade circles of Central Ohio and adjacent districts. Some fears are entertained that the coal miners' strike will impede active operations at a time when it appears that a steady run has commenced, and much disappointment is felt on this account. Manufacturers have, however, anticipated the trouble by using every available foot of space for coal storage, and most of them will be in a position to carry on operations for a month at least whether the strike becomes a reality or not. No improvement is apparent in the bar iron trade. Many mills remain idle, and the few that are running do not make full time. Prices do not show any improvement and inquiries are not numerous. This branch of the iron business was the first to succumb during the hard times, and indications are that it will be the last to recover. Steel billets have been bought rather freely during the past two weeks by mills using only small quantities (500 to 1000 tons at a time), and the average price has been \$16, delivered, although this figure is being generally quoted f.o.b. Pittsburgh.

In sheet mills there is a much better feeling prevailing. Jobbers of the West, Northwest, and South are sending their inquiries broadcast asking for prices for summer and fall delivery, and they appear to have realized that bottom has been reached. If this is not a fact and prices do go lower they will hug the cost marks so closely that there will be no margins for contingencies, and a few breakages or stoppages will wipe out the small profits, obtainable only under the most favorable conditions. Considering the fact that jobbers are in the market and that the roofers are doing better business, there ought not to be

any further decline in sheet iron prices. The ruling figures at present are \$2.35 for iron roofing sheets, roofers' standard gauge, and \$2.40 for steel, f.o.b. Ohio mills. No. 27 stovepipe is held at \$2.25, f.o.b. mill. These prices are for delivery prior to July 1, and are for good sized orders only. Galvanized sheets for the same delivery are quoted 80 per cent. off at mill. The fact that the fine weather of the past two weeks has stimulated building operations is given as a cause for improvement in the iron and steel roofing trade. At Canton, Wheeling, Cambridge and Cleveland it is reported that inquiries are more numerous, and more sales are resulting than at any time for six months past. The demand for conductor pipe, eaves trough, and other building material made from galvanized iron is particularly good, and rolling mills appreciate this fact. The bulk of the trade in roofing and corrugated sheets is in light gauges for small consumers. Orders for heavy gauges are few and far apart. This is accounted for by decreased construction of buildings for manufacturing purposes. An order for about 30 tons of Nos. 18 and 22 corrugated for covering the buildings of the Canton Rolling Mill Company, Canton, Ohio, was placed with the Canton Steel Roofing Company; the black sheets will be made at New Philadelphia. The buildings referred to will contain sheet mills, and it is estimated that the entire product will be consumed by home concerns.

**Manufacture of Tungsten.**—For some time the late Paul W. Schwarz carried on the manufacture of tungsten and its alloys at Phoenixville, Pa. He has been succeeded by the American Metallurgical Works, F. Cremer & Co., Phoenixville, who have purchased the establishment. The works will continue to make fine powdered tungsten metal, 95 to 97 per cent. ferrotungsten, carrying 25 per cent., 37 or 50 per cent., the 35 per cent. being the standard alloy; tungsten slates and tungstic acid. The American Metallurgical Works announce also that in the near future they will add the manufacture of chrome metal, ferrochrome, manganese, &c. They state that much of the imported ferrotungsten is produced in the blast furnace, while that made at Phoenixville is melted in crucibles. They claim that alloys carrying less than 40 per cent. of tungsten are superior to high grade alloys or to refined metal, because finely powdered tungsten when used in making the alloy causes excessive losses, since tungsten in powder form burns away when exposed to a red heat.

Arthur Schoell, the leading spirit of the Niagara Falls Hydraulic Power & Mfg. Company, is considering a novel plan which bids fair to a large development of manufacturing enterprises in the locality. The plan contemplates the construction of a stone building 50 x 220 feet and 16 stories high. The foundations will rest at the bottom of the gorge on solid rock and the roof of the building will be nearly on a level with the top of the bank. In this building he proposes to arrange space for numerous factories, which will be furnished with power for manufacturing purposes from the most powerful Leffel turbines. He has been assured by some of the best engineers that the plan is a feasible one. There is an unlimited quantity of stone on the ground. The remainder of the structure would be of iron and steel.

### The Olsen Testing Machines.

At a meeting of the American Society of Mechanical Engineers, held on the evening of April 11, a paper was read by Tinius Olsen on the Olsen autographic testing machine. We take the following extracts from the paper: Fig. 1 is a sectional front elevation and Fig. 2 an end elevation of a testing machine of 200,000 pounds capacity, and

intermediate lever  $F^2$  to the beam where the pressure is balanced and recorded. In many machines the adjustment of the poise  $q$  is done by the operator turning a hand and cord, or a belt wheel placed in front of the stand  $L^2$ . In this machine, however, the arrangement is shown for the automatic movement of poise  $q$ , which is now used in many places. The automatic movement is accomplished by a belt driven from the hub of pulley, U, at V. this

chine. On top of the beam is seen one-half of a very large pitched screw, 4, for moving the poise; this screw is extended into the casing 3, and on the end is secured a large disk and dial, which shows to the operator the smaller and fractional readings of the stress exerted on the specimen. The dial plate, which is secured to the end of screw, 4, is made to revolve by causing contact between it and the constantly running friction pinion, thus turning the screw

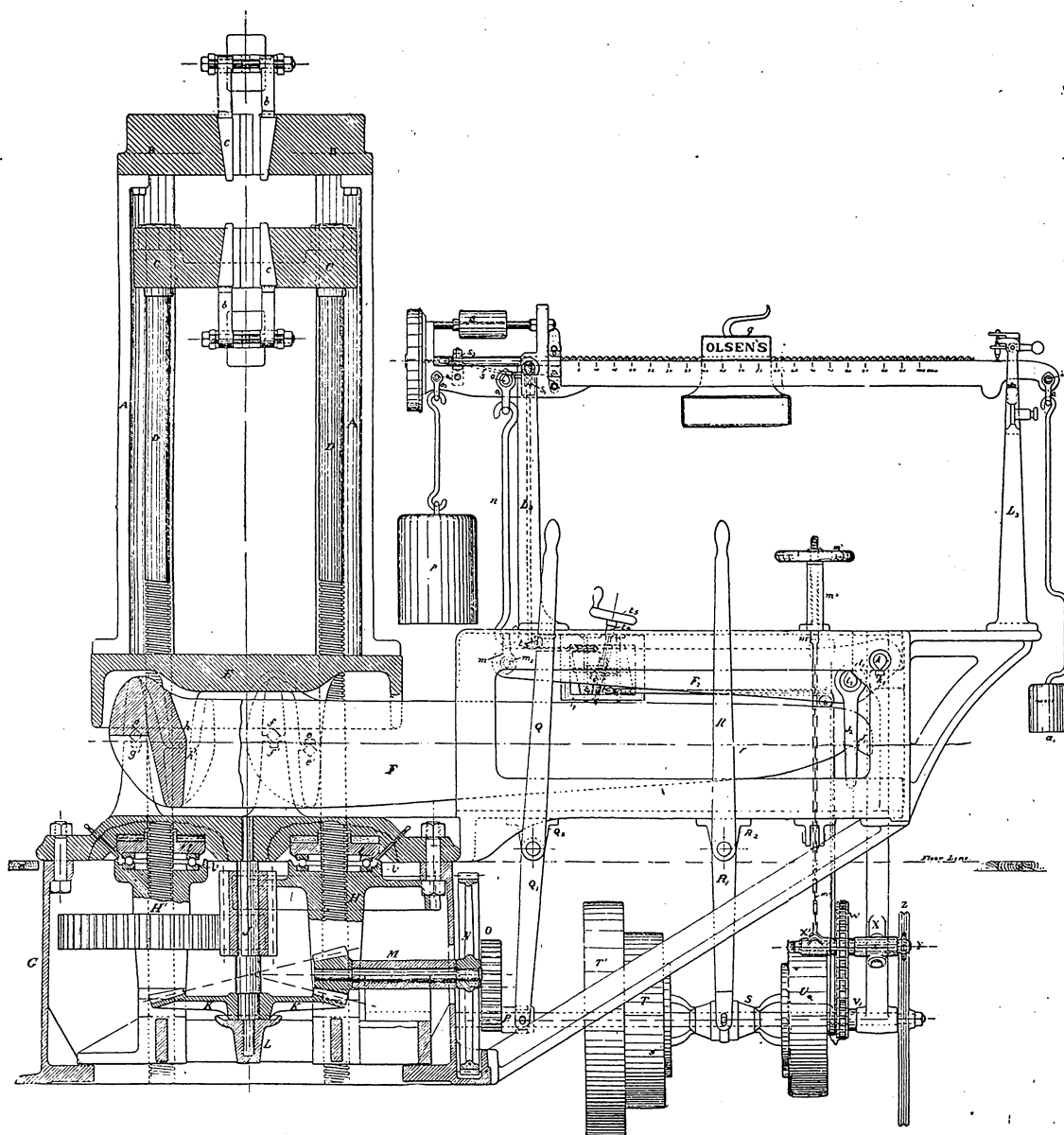


Fig. 1.—Sectional Front Elevation.

### THE OLSEN TESTING MACHINES.

having an automatic device for moving the poise.

The ends of the specimen to be tested are secured in the cross heads B and C by the wedges operated and placed in the proper position by the balanced lever  $r$ . The lower movable cross head C is secured to four screw threaded rods D, to which a vertical motion is imparted by a train of gearing in the base of the machine, and same is operated by power from the countershaft and pulleys J and U. The upper cross head B rests upon four quarter section columns, A, which are supported on the scale platform E. The platform E rests on the scale levers  $F$   $F'$ , which communicate the pressure exerted on the platform E through the

belt runs vertical to and over guide pulleys, Q, then horizontally to the speed regulating cones  $t'$  and  $t''$ ; from cone  $t'$  a small round belt transmits the motion over guide pulleys  $t^3$  vertically to the pulley  $S'$ , which turns a shaft in a bracket secured to the beam, the grooved pulley  $S'$  being so placed that the belt pulls exactly in line with the balancing pivot of the beam, and thus no irregularity in the tension of the belt during the test has any effect whatever on the sensitiveness or operation of the beam. From the pulley and its shaft S the motion is further transmitted to a small friction pinion in the dial casing 3; this friction pinion is in constant motion during the operation of the ma-

chine. This contact is effected by a lever, one end of which is the bearing for the friction pinion shaft, the other carrying an armature for an electro-magnet at 5, the vibration of the beam making or breaking the current at 6 for the electro-magnet. When the beam raises, due to additional load, the contact is made, armature attracted, pinion put into gear and the poise  $q$  moved forward until the beam descends and the contact is broken; at the same time the contact between the friction pinion and the dial plate breaks.

Thus far, then, we have the machine for recording the amount of stress at which a specimen breaks. There

are, however, other points of information about the material tested which are of just as much or even greater importance for the engineer to know, such as the yielding point, and the elongation or the change of dimension of the sample tested. This data, especially the point at which yielding commences, is and has been obtainable in a very crude and unsatisfactory way, and in a great measure has been left entirely to the discretion of the opera-

tor, there having been no means for its correct determination for practical use. The drop of the beam, which is used, and is very marked for many soft iron and steel specimens, is for others not so marked, for still other grades and compositions of materials utterly untrustworthy. To make the machine indicate clearly and unmistakably this point or these points has been my object for many years. About half a dozen different systems for this purpose have been more or less completed, but laid aside, not because each system would not work or could not be made to work, and thus in a great measure accomplish the object in view; but mainly because they became too com-

licated or were too liable to get out of order, or took too much time in their application to be of any practical value. From each attempt, however, some valuable points were gained which finally suggested and helped to develop not only the best but the least complicated of them all, and this device seems to be practically all that can be desired for the purpose. It is simple in construction, easy to understand and handle, always ready for use, quick in its

ment of poise also imparts to the pencil a corresponding amount of motion in the direction of the drum's axis. These distances form the ordinates to the traced curve and represent the stresses. The other motion necessary to trace the line forming the curve which will be the *abscissa* representing the yielding of the specimen, is accomplished by revolving the drum corresponding to such yielding. This yielding motion of the specimen is transmitted to the drum as follows: Starting at the specimen 48, Fig. 3, two collars, 64, are placed upon it at a certain distance apart—say 8 inches, as now generally adopted. On the under side of the upper collar 64 are fingers, 83, one on each side of the specimen, so arranged that they will transmit the central motion of the specimen to the arm 83, which is pivoted for vertical motion at 88, Fig. 4. Any vertical motion of the specimen or upper collar is thus transmitted to point 101, then further communicated by a cord or steel band to one end of the lever 97, which is pivoted at 98. This lever, 97, is placed in a vertical plane under the edge of the balancing pivot of the beam.

Starting again at the specimen, on the lower collar 64 is placed another pair of fingers, 82, which, in the same manner as the upper fingers, transmit any vertical motion of the specimen to the vertical rod 87, Figs. 3, 4 and 5. The lower fingers 82 can be adjusted anywhere along the vertical rod 87, so as to be in proper place for the length of specimen operated upon.

The vertical rod is attached by a pivot to one end of the bar 74; the other end is supported on a pivot at 50, and at a point, 99, on this bar in the vertical plane of the balancing pivot of the beam is attached a band or cord, 95, which first runs down and over a pulley, 96, in the end of the lever 97, then up and over the guide pulley 99 to the enlarged part of the shaft 100 for the recording drum. Thus the vertical motion of the specimen, or the lower collar 64 on the specimen, is communicated to the recording drum, imparting motion to it or allowing same to turn on its axis. The function of lever, 97, whose end is connected to the fingers resting against the upper collar on the specimen, and the other end, in which is the pulley, to the fingers resting on the lower collar, is to separate the motion that takes place by the specimen as a whole from that motion which takes place in it and only between the collars, or to retain for transmission to the recording drum only what may be termed a difference of motion, the motion taking place either in or by the heads of the specimen not being transmitted to the drum.

Mr. Olsen then presented views illustrating the same autographic apparatus applied to a larger machine, and also to a machine designed for use on full sized structural specimens.

#### Discussion.

G. C. Henning said that there is always a great question as to what is good boiler steel, and it is very peculiar that when you look at a piece of steel, when it is tested in the machine, you can tell whether it is good boiler steel which will behave well in a boiler, particularly a locomotive boiler, by a very peculiar marking which appears on the test piece. By the aid of a drawing on the board it was shown that the marks intersect at the same angle throughout. When that marking is found in open hearth steel and the general factors are satisfactory it can be taken for granted

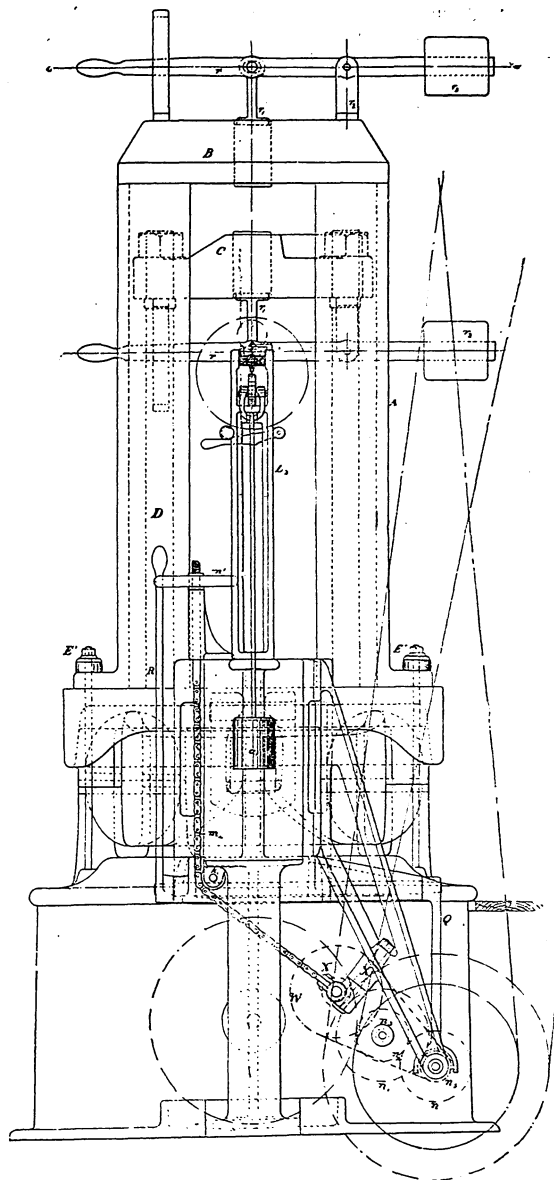


Fig. 2.—End Elevation.

#### THE OLSEN TESTING MACHINES.

tor, there having been no means for its correct determination for practical use. The drop of the beam, which is used, and is very marked for many soft iron and steel specimens, is for others not so marked, for still other grades and compositions of materials utterly untrustworthy. To make the machine indicate clearly and unmistakably this point or these points has been my object for many years. About half a dozen different systems for this purpose have been more or less completed, but laid aside, not because each system would not work or could not be made to work, and thus in a great measure accomplish the object in view; but mainly because they became too com-

application, and not more liable to get out of order than any other part of the machine, as well as of universal use—that is, applicable to the various classes of test.

I will now describe this device. On top of the beam, Fig. 3, is mounted the cylinder or drum, 102, which can revolve on its axle. To this drum is attached a sheet of paper, on which the object is to have the mechanism trace a diagram or curve line which will at the same time show both the stress and the amount of yielding of the specimen. A pencil at 103 traverses the drum and paper in the direction of its axis. It is moved by the same screw which moves the poise, 106, consequently any move-



that the steel is the best that can be got for boilers. If the specimen is entirely uniform and has no markings of any kind then the steel is not good for boilers. Then there is another peculiarity in telling whether the steel is really good or not. If in a flat specimen there is very gradual reduction, then that specimen shows that it is about as good a steel as can be had. If the steel has a shoulder in it, however slight, and then comes down, then there is something wrong in that steel.

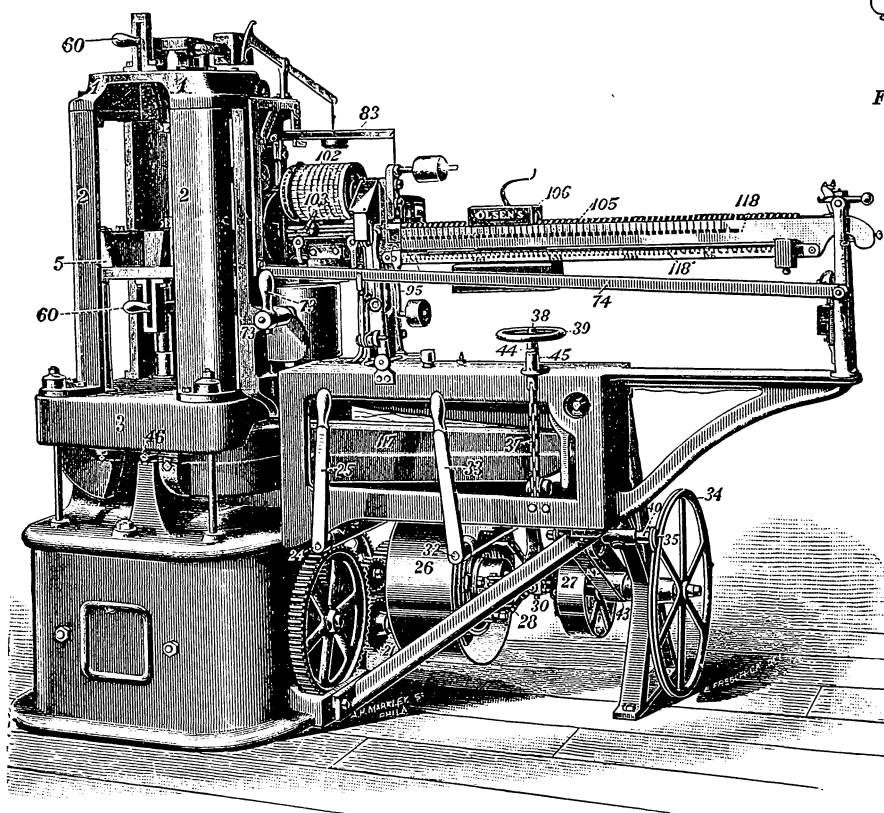
I would like to say something about Mr. Olsen's diagramming apparatus. I think these diagrams are really remarkable. I do not think I have ever seen any more correct or more regular than these, and particularly so in these

paratus I would say that the prettiest thing I have ever seen is a photographic apparatus designed and used by Professor Marten of Berlin. He simply throws a ray of light from a little mirror on a sensitized film. The room is dark except for that ray of light, and having the mirror move in one direction by the motion of the weight, the position of which determines the load on the specimen, the revolution of this very small mirror throwing the beam of light across the sensitized film draws diagrams photographically, and he can magnify them as much as he likes, because it is only a question of casting the ray of light through a lens on a more or less distant screen. Afterward he develops them, and he has ob-

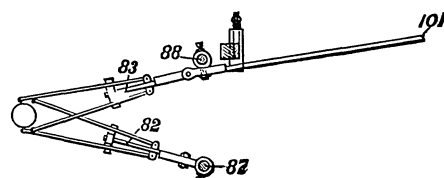
that only when he tests small objects, such as paper or silks. He has not used it for structural purposes."

Mr. N. F. Forney said that W. S. Hudson, formerly superintendent of the Rogers Locomotive Works, had noticed that in punching holes for the stay bolts in locomotive fire box plates there were curved lines radiating from the hole all the way round, and there was also another series of rings radiating in the reverse direction, the appearance being very much like the milling work on a watch case. Mr. Henning said they were simply lines of intersection of stress and would be produced if a plate was hit with a hammer.

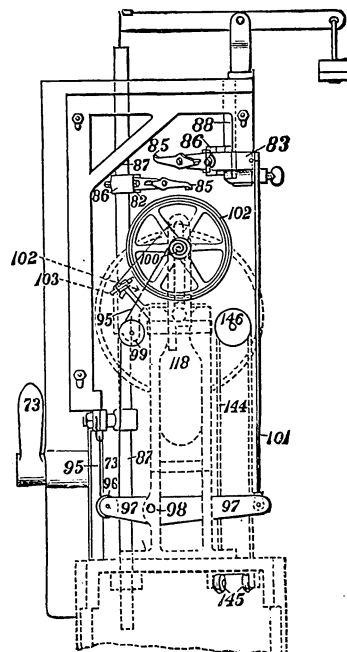
A. E. Mitchell brought up the question of the proper speed to run a testing



*Fig. 3.—Perspective.*



**Fig. 4.—Levers Recording Yield Point and Elongation of Specimen.**



*Fig. 5.—Device Transmitting Stretch of Specimen to Recording Drum.*

## THE OLSEN TESTING MACHINES.

woods. I think they are simply beautiful. You see this shows that this wood, which is white pine, is perfectly elastic. Hemlock is by no means elastic. Hemlock is by no means a desirable wood for building purposes, because it is so irregular and the fibers are not parallel, and hence some of the fibers may break before others. But in the case of oak you will notice how very straight this line is. There are some irregularities here, which I think must be due to some temporary derangement. When you get to the extreme test of that wood it becomes suddenly very weak, while in the case of white pine there is nothing of the sort. You have a gradual sliding of the fibers. Then in this case of ash you see a very decided break and a very good elastic line. Of course, it is stronger than white pine.

"In regard to the diagraming ap

tained some very beautiful results. Another thing he does is rather unique. He makes a diagram of these minute extensions. These extensions within elastic limit are less than 0.01 inch actual measurement. He has a little apparatus consisting of a movable glass weight, and the specimen moves a diamond point. That diamond point engraves a fine line on the glass, and it is so small that the head of a pin will more than cover the whole diagram. Then he puts that in his lens and projects it on a screen. When thrown on a screen and compared with the observations of other instruments the results are comparable. But it is remarkable how you can make a microscopic picture like this and throw it on a screen and check up your results. Of course, he did not intend to check up his results by that diagram, but the diagram was sufficiently good to do that. He uses

machine. He said that if a plate is tested on a certain machine it will give results like the specification; but if tested on another machine at different speed the results would be different. He thought that an inch in three minutes was the proper speed.

Mr. Henning in reply said : If you test soft steel, especially basic steel, it does not make any difference what speed you test at within your capacity of observing anything about the test. Of course it is well known that in the Carnegie works you test so fast that you simply take the man's word for it that it carried that much. But if you know your business you do not let them run a machine so fast. There is a reason why the machine should show higher results when you run very fast, and that is you apply so much momentum through the test piece on to the beam, which is of considerable mass.



that it will always keep carrying more. When you come to a rest the machine balances all right. But as you keep on running, the weight is always ahead of the load you have on the test piece, and the faster you run the further the weight will be ahead of the load, in order to counteract the momentum due to the increase of the force applied. If you apply the same force, the momen-

where a firm wanted to send some copper for fire boxes to the Baldwin Locomotive Works, who were going to send some furnaces to South America, where they have a fondness for copper. They wanted some unprejudiced party to say what the copper would do. The requirement was, stretch 25 per cent. and tensile strength 35,000 pounds. They asked me what kind of sample I

post office and got Mr. Starbuck to test it, and got the test all right. I could not absolutely get that by any way by which the old Fairbanks machine could be run. The specifications were based on a hydraulic machine.

There is something, I am sure, in the speed at which the test is made beyond this mere inertia of the beam, which, of course, does enter as a problem when two tests are made at nearly the same speed. But where there is a great difference in the speed I think the material comes in.

Concerning the time of testing after rolling Mr. Henning said:

If you test material immediately after it comes from the rolls the material will be decidedly weaker than if you kept it lying idle from 12 to 24 hours. Our better rolling mills never give you a piece, especially thin shapes of plate or small bars, that has not had a chance to recover after being rolled. If you take a sample from a plate as it comes from the roll it will not give the ultimate strength, nor will it show the elastic limit or elongation, within a very considerable amount. So it is often a question of rejection or acceptance whether you allow the material to rest a while before you test it or whether you test it fresh from the rolls.

### Rusting of Iron

Professor V. B. Lewis of the Royal Naval College, Greenwich, at a recent meeting of the Institute of Naval Architects in London, presented some interesting remarks as to the rusting of iron, which, he explained, is a definite chemical action due to the conjoint action of air, moisture, and carbon dioxide upon the metal. The increased rate of action may be due, he said, either to increase in chemical action brought about by local increase in temperature, or it may be due to galvanic action set up between portions of the same metal at different temperatures. The fact that the double bottom plates of ships near the boiler corrode more rapidly than similar plates in other parts of a vessel is undoubted, and the increase in temperature near the boiler is the only factor. It is also noteworthy that the plates at the bottom of the cellular spaces which are kept cool by contact with the sea water do not corrode; and cases are not wanting in which parts of a plate which get locally warmer than other parts—although the difference can only be a few degrees—corrode much more rapidly than the cooler portions. Experiments show that the rapid corrosion found in the double bottoms near the boilers or other sources of heat is due to galvanic action, and not to rise of temperature simply increasing chemical activity; but it must not be forgotten that when ashes are drawn and quenched with water—especially if sea water be used—gases having a corrosive action on metals are very apt to be liberated, and probably tend to increase the corrosion found near the boilers.

The freight rate on pig iron from Chicago to the Pacific Coast is now 30 cents per 100 pounds or \$6.72 per gross ton. This is the lowest transcontinental rate ever known. It is so low that Chicago manufacturers would be able to compete with English furnacemen for the trade of the coast—if there was any trade. This may be termed a one-sided opportunity, which will of course be lost when trade revives.

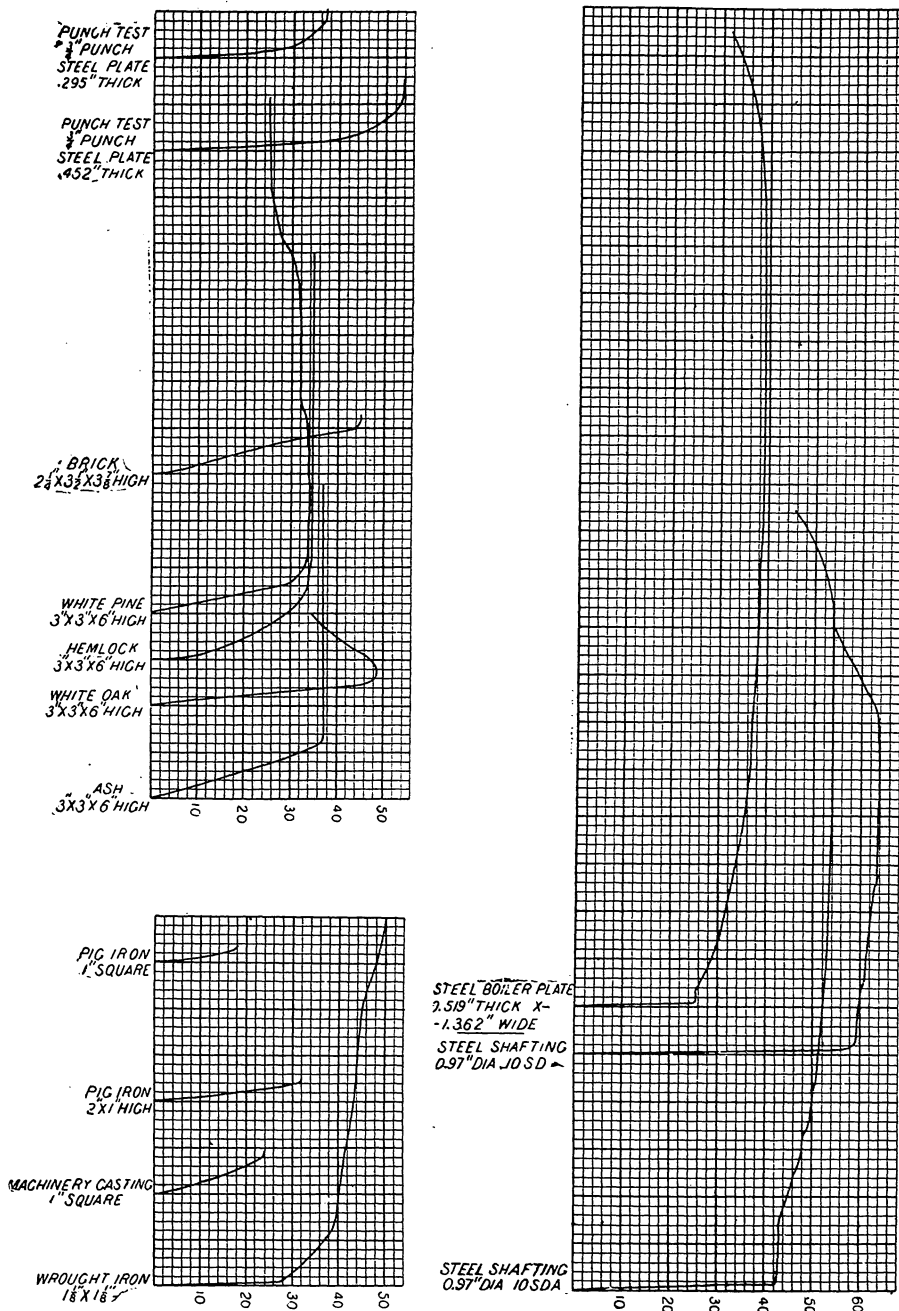


Fig. 6.—Diagrams Traced by Machine.

### THE OLSEN TESTING MACHINES.

tum in the beam will be the same. There is always an increase of force applied. Hence there is always an increase of momentum, which must always be counterbalanced by a slightly advanced position in the weight. But if you run as fast as 2 inches in one minute on the ordinary soft steels you will not find any difference. When you test boiler steels which have different qualities altogether from the soft steels, there you find considerable difference.

Professor Hutton mentioned a case which came under his own observation,

wanted to test. I said give me at least 4 inches of reduced section taken from the 1/2-inch plate. We were running at that time on the old Fairbanks screw machine, and I found it impossible to give that 35,000 pounds, but I could give them 35 per cent. to 40 per cent. stretch right along, but we could not raise the tensile strength higher than 33,000 pounds. I finally told these gentlemen that I thought the Fairbanks machine was not the one to test this piece on, because those people down there are used to a hydraulic machine. So they took the specimen down to the

## The Western Foundrymen's Association.

The regular monthly meeting of the Western Foundrymen's Association was held Wednesday evening, April 18, 1894, at 225 Dearborn street, Chicago, Ill. In the absence of the president, C. K. Pittman was elected temporary chairman.

Among those present were the following: C. K. Pittman, Geo. H. Sargent, the Sargent Company; H. O. White, L. W. Lukins, Illinois Malleable Iron Company; N. C. Fisher, H. S. Vrooman, Garden City Sand Company; J. Bowie, Walburn-Swenson Company; John M. Sweeney, General Engineering Company; O. T. Stantial, Illinois Malleable Iron Company; H. L. Hollis, Hollis & Emmerton; J. K. Mackenzie, Dickman & Mackenzie; W. Leahy, Wells & French; F. W. Harrower, James Frake, H. O. Skinner, Henry O. Skinner & Co.; J. E. Moore, Cary & Moore; H. T. Murray, Robert Hughes, H. A. Forsythe, Backman & Forsythe; F. B. Whitcomb, A. T. Whiting, S. Johnston, Detroit Foundry Equipment Company; John H. Blood, J. L. Hecht, Wm. Dering & Co.; M. C. Bullock, M. C. Bullock Mfg. Company; A. W. McArthur, Rockford Foundry Company. The following applications for membership were read and the applicants unanimously accepted as members of the association: M. C. Bullock of the M. C. Bullock Mfg. Company, Chicago; E. C. Greenlee of Chicago, Matthew Addy & Co. of Chicago, Illinois Malleable Iron Company of Chicago, Antrim Iron Company of Mancelona, Mich., and Hollis & Emmerton of Chicago.

The secretary read the following paper by Thomas D. West entitled

### Loss of Iron by Remelting and Slagging.

The last paper by Hon. E. A. Wheeler on "Furnace vs. Foundry Practice," before the Western Foundrymen's Association, February 28, 1894, cites the case of one of his customers losing 22 per cent. iron at the slag hole. I would say that the customer referred to is myself.

Before seriously discussing the subject in hand, it is essential that some explanation be made of the elements that have misled Mr. Wheeler in judging of the cause of our slag or the loss of iron, which he cites as occurring in our largest cupola. This cupola is 66 inches inside the lining, and by referring to the cut, Fig. 1, other dimensions can be obtained. Each heat averaged about 50 tons. The iron we use is all Bessemer pig; no scrap excepting a few gates, which for a 50-ton heat would weigh about 1 ton. Our Bessemer pig runs about 1.60 per cent. in silicon and 0.030 per cent. in sulphur, 0.29 per cent. manganese, 0.092 phosphorus. We use 2000 pounds of Connellsville coke for the bed and 450 pounds between charges. The pig on bed was 8000 pounds and between charges 6000 pounds. This in a heat of 50 tons would leave us melting at the ratio of 1 to 11.24, and if we take into account 300 pounds of coke saved from the dump, it would leave us melting 1 to 11.63. Considering that we use about all pig iron and no light scrap iron to speak of, this, I think, will be conceded to be good melting.

About one year and a half ago a person was justified in calling the apparatus we now use for melting iron "a

cupola;" but since the writer has been experimenting with center blast, side blast, straight and crooked blasts, it is a hard matter to say what one is looking at, for the cupola is so full of holes with branch pipe and offset attachments there is hardly any cupola left. The slag when analyzed was found to contain 26.80 per cent. metallic iron as oxide. In addition to this there was 1.97 per cent. of very fine shot iron in the sample of slag selected. We use a No. 9 Sturtevant fan running 1400 revolutions, and the blast pressure raises a column of water 9 inches, which I consider a mild blast.

As we did not weigh the slag in these heats, we are unable to give the percentage of iron lost.

It was not 26.80 per cent. of the iron charged that was lost, but the slag coming from the cupola contained 26.80 per cent. of metallic iron. Mr. Wheeler seemed to infer from the slag being black that the cupola was working cold. It is enough for a foundryman to know that if slag runs freely and there is sufficient to keep two men busy wheeling it away from a cupola, the conditions are just the reverse of being cold. In fact, unless a cupola is working hot, the chances are very unfavorable to drawing off any slag.

Our foundry being about 300 feet from Mr. Wheeler's blast furnace, affords us exceptional opportunities in observing furnace vs. foundry practice when we desire to do so. At the time when we were making such an extra bulk of slag we learned that the furnace had just changed to a new mixture of ores, and this fact rather led me to think something might be wrong with the ores or their working in the blast furnace. For in remelting the iron I never saw such a volume of slag come from all pig iron. As it came out it foamed very much. I am now inclined to think that we did not have a great excess in weight over any ordinary heat where the slag runs out and solidifies in a fairly condensed body. But whether it weighed more or not it occupied fully four times the bulk of what generally comes from such sized heats, and I confess I am still at a loss to fully satisfy myself as to the exact cause. If it was not wholly due to the iron, the only cause I can ascribe it to is an excess of air blowing in through an upper tuyere E, Fig. 1, which upon the days in question was about 4 inches in diameter, and later on was gradually reduced to 3 inches in diameter. The iron might have had some peculiarity that took kindly to being oxidized to a foaming slag, and the little excess of air at this elevation overcame the balancing point, and thus caused the excessive bulk of slag we received. I cannot conceive of any other elements being responsible for the great bulk of slag on the days mentioned, as we had a large amount of coke and limestone on stock that was from one order, out of which the heats before and after this occurrence were supplied. We cannot think the trouble was due to the coke, and one car of limestone will run us for a month, so it could not be found in that element.

We present a sketch of the cupola in order that you may intelligently reason for yourselves as to its workings, and I know the peculiarity of its formation will attract attention. It is the writer's last experiment but one in the matter of approaching center blast. The design here shown was used for about six months and achieved very near the commendable results attained by the bottom center blast tuyeres which the

writer presented before this association October 18, 1893.

Returning to the subject of this paper, I can hardly refrain from giving weight to the character of the foaming slag as being more due to the iron than the blast. The furnace superintendent, P. C. Reed, intimated that the slag appeared as though it might be high in alumina, thereby causing its light foaming character, and implying that the furnace was not working well with its new mixture. He seemed inclined to think it might be due to the iron. In fact, he admits that the slag coming from the blast furnace when they changed to the new mixture foamed up just about the same as the slag did from our cupola. In this coincidence, no doubt, lies the key to the whole problem, as when we look to the blast entering our cupola we find all the difference that could exist would be the reduction of the diameter of the upper tuyere E, Fig. 1, from 4 inches down to 3 inches. It hardly seems possible that this should account for the large volume of foaming slag we found coming from our cupola.

Since this occurrence we have given considerable attention to the slag question, and Mr. McShiras, the chemist, finds by chemical analysis the following weights of iron to be lost through slags: In a heat of 40 tons March 15, 1894, we had slag coming from the slag hole weighing 1700 pounds. The analysis showed this slag to contain 3.34 per cent. of shot iron and oxide of iron equivalent to 17.25 per cent. metallic iron, a loss of 350 pounds of iron in the 1700 pounds of slag, and to the total weight of iron charged the percentage of loss would be thirty-nine one-hundredths of 1 per cent.

Another heat of 40 tons on March 19, 1894, which we followed up, showed the slag to weigh 1630 pounds. The analysis of this gave 2.70 per cent. shot iron and an equivalent of 15.69 per cent. of metallic iron, a loss of 300 pounds in 1630 pounds of slag, and to the total weight of iron charged the percentage of loss would be  $\frac{3}{100}$  of 1 per cent., which, figuring the iron at \$12 per ton, would show a loss of \$1.58, or a little less than 4 cents per ton. One factor which it will be profitable to dwell upon before proceeding further with the paper is the reason for the difference of loss in the two 40-ton heats. As our metal is carried away from the cupola by a 5 ton ladle, and there are often lulls in getting back with the crane ladle, I have permitted the practice of leaving the slag hole open all the time, so as to make sure that the slag or metal do not reach the tuyeres. Feeling satisfied we were losing some metal by letting the blast continually blow out of the slag hole, I decided to try in the second heat quoted to plug and tap the slag hole at intervals, or just a few minutes before tapping out. By doing so we obtained, as shown, a saving of  $\frac{1}{100}$  of 1 per cent. of the total weight of iron charged, or in other words, we saved 29 cents in a heat of 40 tons at the risk of letting the iron or slag fill up the tuyeres, and hence bung up the cupola. By this method of retarding melting, to save a little iron, we might lose several hundred dollars in castings through bad melting or dull iron.

Where conditions are favorable to tapping a slag hole at intervals, or just before tapping out the iron, the above figures clearly demonstrate the economy of such practice; and it is one that as a general thing can be safely followed; but in cases where the tap-

ping out and plugging up of a slag hole would require a man solely to look after it nothing is to be saved by this practice.

The limestone which we use for a flux proves by analysis to be exceptionally high in carbonate of lime, and we consider it the best we have ever had experience with. For every 3 tons we use 90 pounds, placed on top of every charge. There is no doubt that 1 or 2 hundred weight of slag could be added to the totals given above, which could be gathered from the skimming

inventory of all stock. For the year 1893 we find a loss from remelting of about  $2\frac{1}{2}$  per cent. There are chances, as can readily be seen, of part of this being lost in the way of fine scrap mixed with shop sands and dirt, and also wheeled out with the cinder and tumbling barrel refuse, and hence it would not be right to attribute it all to loss by melting.

As to whether we can burn iron I am not prepared to say; but we can look to oxidation for the greater percentage of loss in remelting iron, and the above

iron or bath being exposed by being freed of slag, and thus causing the extraordinary character of our slag on the days above cited. If that occurrence was due to our blast and not to any fault of the iron used, I would then say it was caused by an excess of air in the upper tuyere E, Fig. 1. This idea cannot but suggest the question, Are upper tuyeres according to their area larger promoters of oxidation than lower tuyeres?

I also think there is another feature of this subject that will bear discussion, and that is this: Will not some clean irons oxidize faster than others? Of course I mean this question to be chemically considered. We all know that the more surface we expose to the effects of blast and heat the faster the oxidation. And hence with light scrap iron we must expect the greater loss. But take our case, where one is using all good clean pig iron, we might put the question, Are there not chemical compositions in some pig metals more favorable to oxidation and volatilization than with others? Then, again, another question that will bear investigation is, What does slag come from? Taking the case of the first 40 ton heat cited above, we find there were 350 pounds of iron and 1230 pounds of limestone used for that heat, which we might figure as chiefly constituting the 1700 of the slag found, thus leaving us 120 pounds to account for. To cause thought and further discussion I will ask, What does this 120 pounds chiefly come from, scale of the iron, lining of the cupola or impurities of the fuel?

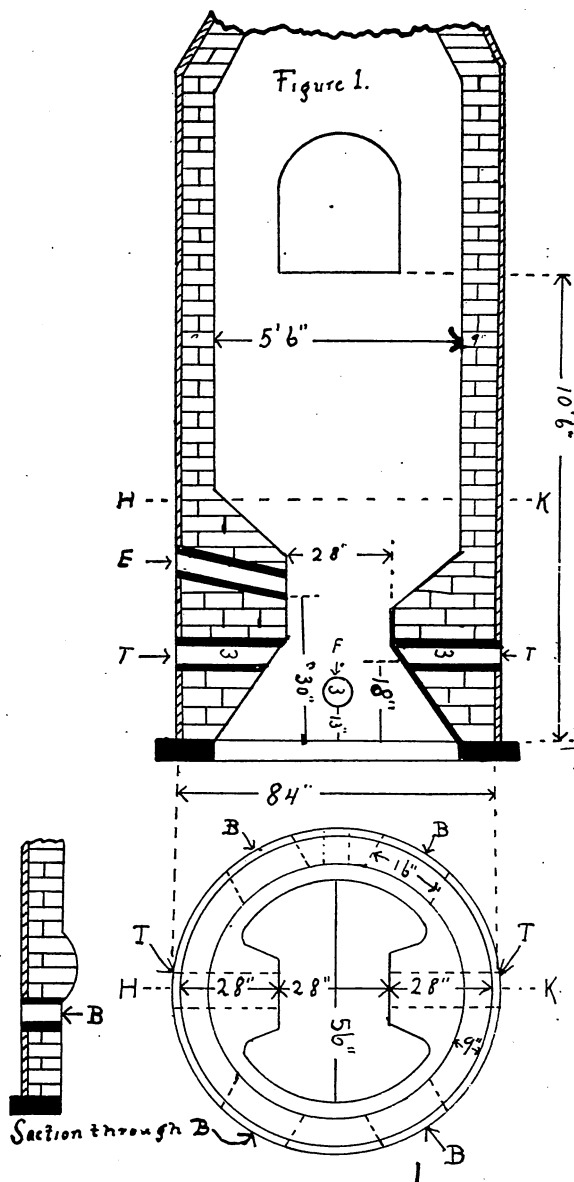
H. L. Hollis: The main part of the discussion should be taken up in answering some of the questions at the end of the paper. Mr. West has overlooked the ash of all his fuel, I think, in making up his slag. He probably has 10 per cent. ash in his coke, which would come very close to accounting for the 120 pounds that are lacking.

J. K. McKenzie: This paper does not state what kind of fuel they are using. The ash would amount to anywhere from 5 to 12 per cent. Mr. Hollis has taken the average of Connellsville coke. There is liable to be more or less variation on account of the different kinds of fuel. There is another point. In remelting iron there is a loss of silicon. The silicon is converted into silica and goes into the slag as such. In melting a large amount of iron it makes quite a considerable weight of slag. The average loss of silicon in remelting iron is 0.2 per cent. Another point is that the sulphur in the coke partly goes into the iron and some of it will go into the slag. It is an impurity. Also the manganese goes into the slag as oxide of manganese. Then again, the hot or cold working of the cupola would make a great difference. I have seen 2 per cent. of iron in the slag worked in a hot cupola, and 16 per cent. of iron worked in a cold cupola. The iron goes into the slag as ferrous silicate. I would like to ask if any one knows how much limestone is used. My experience would be about 1 to 25 for fluxing iron.

Mr. Pittman: Mr. West says 1230 pounds to 40 tons of metal.

Mr. McKenzie: Six thousand pounds of iron to 90 pounds of stone. That is 1 to 66. Is that not very little limestone to use for fluxing iron?

Mr. Sweeney: It has been my practice not to use much limestone. It does not appear clearly in this paper whether the droppings at the bottom are included in the estimate made in the slag loss.



WEST'S PROJECTING CENTER TUYERE CUPOLA.

of the ladle and the dropping of the bottoms. Our apprehension as to loss of iron through slag was allayed when we discovered it was less than one-half of 1 per cent. It is generally conceded by foundrymen at large that loss through remelting unburnt cast iron ranges all the way from 2 per cent. up to 10 per cent., so we must look elsewhere than to slags for cause to effect the total loss generally found.

The heavy character and condition of our work will not permit a following after heats to find out the exact loss, and we can only get at it by deducting the weight of the castings made from the amount of metal bought during one year, which is not a bad plan, as at the end of each year we then take a careful

figures would lead us to believe that the greater loss was by way of the stack. I do think that an excessive blast does more in oxidizing and volatilizing the metal in a cupola and thus causing a loss than is generally conceded, and I also believe that the greater part of the oxidation or burning of the metal, as commonly termed, is done above the tuyeres, as the metal is dribbling from the melting point through the fuel down past the tuyeres to the bath of metal in the bottom, and also from the surface of the metal above the tuyeres at the melting point, as it momentarily exposes a semi-molten surface to the effect of the blast.

I do not accept the idea Mr. Wheeler advanced of the surface of the liquid

Mr. McKerzie: It does not seem to me that Mr. West's calculation is quite complete. It hardly seems fair to take one or two heats after you have your cupola in good running order and take the clean weight of metal and clean weight of slag from those two heats and calculate that as your average, when your cupola may be in for two or three days, and under these conditions the amount of slag and metallic iron might vary considerably. In dumping a cupola there is an endless quantity of waste material and partly melted stuff containing a large percentage of iron, and that should all go in and be charged up with the weight of the slag, beginning with the first blowing in of the cupola. I do not think it is fair to take two or three heats in the middle of the melt and call that an average. A loss of 0.33 per cent. of it seems very small to a practical man.

Mr. Bowie: Our average loss of iron is about 5 per cent.—that is, running from 15 to 20 ton heats a day in a 40-foot cupola having a 66-inch shell and 6-inch lining. I have never taken any notice whether atmospheric conditions would have any effect on cupolas. In running air furnaces I have noticed a great difference on different days. We had a 20 ton furnace and used to light it about five o'clock in the morning. We used the same iron and the same coal and would have the same men working, and some days the iron would be all melted by 11 o'clock and some days it would not be melted before one o'clock.

Mr. Sweeney: Air furnaces are affected by the way the wind blows, but the cupola is not to the same extent. With air furnaces, when the wind blows in one direction the furnace will be very hot and when the wind is in another direction the furnace will be very slow.

Mr. McKenzie: In a general way, as we all know, the foamy appearance of most substances is caused by occluded gases.

Mr. Bowie: The loss is so much less than I have ever been able to obtain, and the proportion of limestone so much less. Mr. West reports 0.31 per cent. loss in the heat, and I count myself very lucky when I run down to 3 per cent. His practice is 1 to 65 of limestone, when in ordinary practice it is 1 to 50 or 1 to 30.

Mr. Leahy: I think Mr. West is using altogether too much limestone. On our everyday heats we only use from about 1 to 50. In regard to the former question, I think the charging of the cupola has a great deal to do with it. Sometimes the iron and fuel will cling to the sides of the furnace, and in that way will cause it to be foamy. I have had it in my experience happen quite frequently where it was not charged properly.

Mr. Pittman: In what way was it charged to cause that foam?

Mr. Leahy: Sometimes I laid it down so that the fuel and iron were charged too close and did not allow it to come down to the melting points. I have always thought when a cupola foamed that it was not charged properly and I have always found this to be the fact on investigation.

Mr. Sweeney: I think the matter of limestone should not be compared as between foundrymen, because the man who melts from 15 to 20 tons of iron in a day would not have the same proportion as the man who melts from 40 to 50. It is that difference that makes so many different statements. With 15 to 20 tons I do not think any flux is

necessary. The larger the amount of heat the greater proportion of flux is used. The best place to get statistics about limestone would be in a Bessemer steel plant where the cupolas are kept running constantly, and where the comparisons are to some extent alike as between all steel works.

Mr. Whitcomb: I have had some experience in using limestone and I think what makes the iron foamy is too much blast and too much stone. If when the iron foams you will stop the blast for a few minutes you will not have any trouble. A man was once having trouble with his furnace in that way and he came to me for advice. I told him to slack his blast. He afterward said that it helped him out all right.

Mr. Stantial: I would not think of using limestone with 15 to 20 tons. On larger heats we have to use limestone. On large heats running from 45 to 50 tons we use from about 1 to 25 or 1 to 30. I have noticed the foaming, but have never paid particular attention to it.

Mr. Sweeney: I believe an excess of blast would cause foaming of the slag.

Mr. Stantial: We have been told tonight that this foaming could be laid to occluded gases. I rather think that it could be laid to air that is contained in it rather than the gases. The air that is blown into it might cause the foam. With a heavy blast on you will notice heavy festoons of mineral wool hanging all over your rafters. I think that is only carrying the thing a little further. I would like to ask one question, viz., Have any of the members used fluorspar and limestone in the cupola, and if so, do they consider one better than the other?

Mr. Whitcomb: I have used them both, but I could not tell that there was much difference. I do not think there is anything better to use than limestone clear.

Mr. Leahy: I have used fluorspar some. It seems as if one can get a very fine slag by the use of fluorspar and limestone both together. I have used them frequently in that way and found I got a very fine slag. In fact, I keep the fluorspar on hand right along, but we do not make a practice of using very much of it except when we run out of limestone. The objection I have to fluorspar is that it contains too much lead. It is pretty hard to get it clean.

Mr. Sargent: I should like to ask the expense of fluorspar as compared to limestone.

Mr. Stantial: I have used both of them and I have gone back to limestone as answering the purpose fully as well with a great saving in the first cost. As regards the comparative cost, I believe limestone can be had for \$1 a ton and fluorspar from \$6 to \$7 a ton. Although you can use less fluorspar than limestone, I never could get it down so cheaply.

Mr. Sargent: I heard of an interesting use for slag. Mr. Goetz of Milwaukee said he saw it used in Sweden for drying cores. That is not bearing on the question, but it is a matter of interest.

The secretary read a short paper by Dr. Edward G. Kirk on

#### Cost of Melting.

There is probably less known about the actual cost of melting iron in cupolas for foundry work than about any other branch of the foundry business. But few foundrymen make any attempt at keeping a cupola or melting account. Many of those who do, keep it in such a way that they not only fail to learn

the cost of melting, but are misled by the account to suppose their melting costs them a great deal less per ton than it really does. In the majority of foundries the melting is left entirely in the hands of the melter, who as a rule has no system for doing the work, and has no control over his assistants or interest in having them do a fair day's work. In many of the foundries I visit twice the number of men are employed as cupolamen as are employed in melting the same amount of iron in other foundries, where the facilities for handling the stock are almost the same, and the expense of lining and daubing material is frequently double with one melter what it is with another in the same sized cupola with the same sized heats.

In many foundries the fuel is not weighed, but is measured in baskets, or the number of shovels counted and the weight estimated. When the fuel is measured in baskets the baskets always stretch and enlarge, and an old basket frequently holds one third more than a new one; from 10 to 20 pounds more can easily be piled on the top of a basket after it is filled. Foundrymen who charge their fuel by the basket always use more fuel than they estimate they are using; when the shovels are counted, each shovel may be made to weigh more than is estimated, and a few extra shovelfuls are always thrown in, for fear some were not full. When too much fuel is used in a cupola there is not only a wastage of fuel, but there is slow melting, increased destruction of the lining and an increased wear and tear of the blast machinery. For these reasons every pound of fuel that goes into the cupola should be accurately weighed. Even when the fuel is supposed to be accurately weighed there should be some check on the melter, for he will shovel in extra fuel if not watched.

At a foundry I recently visited in New Jersey an accurate account of the melting had been kept for a year. At the end of the year the president of the company had figured up the amount of fuel consumed in the cupola and compared it with the amount purchased, and found they were short 260 tons. At another foundry, where the melter always reported melting 7 pounds of iron to 1 pound of anthracite coal, they ran short 300 tons in a year. This kind of work should be prevented by checking up the melter's report and comparing it with each carload of fuel consumed.

A cupola book should be provided, with blank spaces for recording the weight of coal or coke in the bed and charges, and the weight of each brand of iron, No. 1, 2 or 3 and scrap, showing the exact mixture of each charge and heat. A note should also be made of the quality of iron produced from the mixture. Such a record is of great value in making mixtures and charging a cupola, if it is properly kept.

The cost of melting per ton is figured in a number of different ways, but to be of any practical value the entire cost of melting should be figured on as follows:

Interest on cost of cupola plant and depreciation in value of same.

Fire brick for relining and repairs.

Fire clay, loam and sand for cupola and ladles.

Repairs to cupola, blast pipe, elevator, scaffold, runway, blower, &c.

Belts, oil, &c., for blower.

One-fourth the entire cost of engine.

Tools, wheelbarrows, buckets, hose, shovels, forks, rakes, hoes, sledges,

picks, bars, trowels, bod sticks, tap bars, &c.

Wood for lighting up and dredging ladles.

Coal or coke consumed in melting.

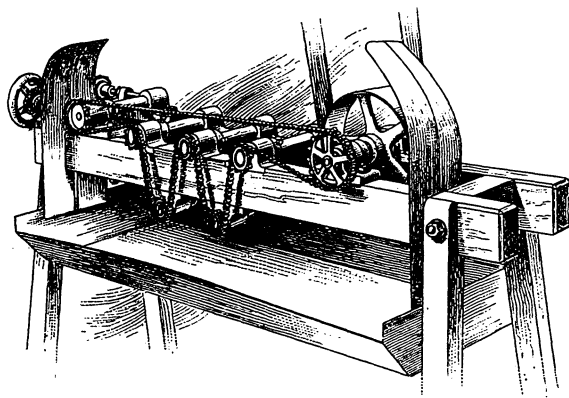
Labor employed in removing the dump, making up cupola, milling dump and gates, collecting gates, scrap and bad casting from foundry, placing iron and fuel on scaffold, charging, breaking and piling iron in yard, breaking up bad castings, daubing ladles, &c.

When the cost of all these items has been learned, and the amount divided

last week. The following firms are interested in the Mahoning Ore Company: The Mahoning Valley Iron Company, C. D. Arms, the Andrews Brothers Company and the Monongahela Furnace Company of McKeesport.

#### Bicycle Chain Testing Machine.

The center links of the chains made by E. C. Stearns & Co. of Syracuse, N. Y., for their bicycles are made of



BICYCLE CHAIN TESTING MACHINE.

by the number of tons melted, it will be found that the cost of melting is about \$2 per net ton of iron in the ladles. In foundries with all the modern improvements for handling the stock the cost is a little less than \$2 per ton, and in foundries with none of the improvements for handling the stock and no system in melting the cost per ton is as high as \$3. When there is doubt as to the accuracy of weights in charging, the weights should be compared with the fuel purchased and castings sold, and the cost of melting may be figured on the weight of castings sold in the place of the amount of iron melted. To make a cupola report of value the fuel, labor and tool accounts should be kept separate, and an effort made to reduce the expense of each account.

Mr. Bowie: I think that the cost of melting iron is generally given as lower than it really is. I have known of cases myself in which, when the estimates were made and compared with the amount of fuel bought and the amount reported used, there would be a difference of several hundred pounds. Of course it had been used but not taken into account. We paid our melter so much per ton, including his labor and fuel. We paid him on a sliding scale according to the size of our heats. He did all the work and was charged for the fuel.

Mr. Hughes: It seems to me that we cannot compare the large works where they have so much apparatus for handling the material with the small foundries where most of the work is done by hand. The cost of labor would be different. The cost of the plant would also have to be taken into account.

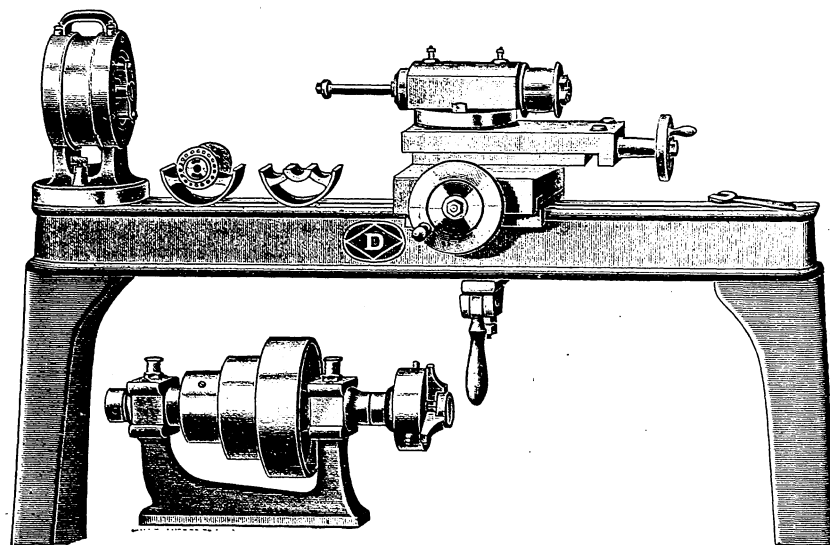
The Mahoning Ore Company of Youngstown, Ohio, have filed papers with the Secretary of State increasing the capital stock from \$40,000 to \$100,000. This increase was decided upon at the meeting of the stockholders held in the offices of the Andrews & Hitchcock Iron Company, Youngstown, Ohio,

hardened tool steel, and the side links of stamping steel. After the chains have been set up and riveted they are put under a strain of 2000 pounds, after which they are placed on the testing machine which we illustrate. This machine consists of a series of sprocket wheels so arranged as to give the chain passing around them a facility of action that could not be obtained in actual use. The chain is run at a speed of

siderable business, but in the face of a limited demand. Little is being done at the bottle fastener works of H. W. Putnam, there being a large product stored. The season is approaching, however, when the demand is expected to increase, and the works will then resume in full. The large machine shop and foundry of Olin Scott have been running of late on small orders. The Cooper Mfg. Company, after five months' idleness, have again started on full time with a full complement of employees.

#### The Diamond Ball Bearing Grinding Machine.

Manufacturers of bicycles who have used ground and true balls for their bearings found that it was essential to secure a true ground seat or surface for the balls to travel in, and that without it the best results could not be obtained. The machine here illustrated was designed by the Diamond Machine Company of Providence, R. I., to do this work. It is arranged with two heads and two styles of chucks. One of the heads and chucks holds the small circular hubs to be ground true for the balls to revolve in. The other head and special chuck is arranged to hold the bearings of the wheel hubs and pedals, both of which require a true, smooth surface to give the best results. This latter head is arranged to grind one end of the bearings, after which the head is swung one-half way round without removing the work from the special chuck which holds it. This insures both ends being ground perfectly true and parallel with each other. The carriage in which the emery wheel revolves has movements by hand wheel and screw both lateral and longitudinal. It is arranged with a swivel head to secure any angle. The emery wheel spindle is made of steel



THE DIAMOND BALL BEARING GRINDING MACHINE.

about 2 miles per minute and for a time sufficient to develop any possible imperfection. The quality of the chain is shown by the statement that  $\frac{3}{8}$  inch is the greatest increase in length ever noted in a chain after having been tested on this machine.

Nearly all the manufacturing industries at Bennington, Vt., have started up and in the aggregate are doing con-

with long bearing bronze split box, and fitted every way secure from emery dust. Also arranged to secure a high rate of speed for the emery wheel. There is one arbor provided to hold the small wheels, which latter is fitted to taper in the spindle head. There is one split chuck provided to hold emery plugs three inches long, which as worn away can be brought forward from the chuck. The necessary countershafts and drums are supplied with the machine.



## San Francisco News.

The freight question is again going to cut a considerable figure in commercial circles for some time to come. It was thought when the North American Navigation Company took the field and kept it so long that the freight question was settled for all time to come. But it was not so to be. The company was once or twice on the eve of bankruptcy and it has at last given up the ghost. It is no more, and the vessels employed by it go over to the Panama Railroad Company. They are advertised now in the name of that company. This has been followed by an immediate advance in freights on the part of the Southern Pacific, and the Panama Railroad Company will follow in their track. They will not, of course, advance proportionately, and San Francisco will still have a considerable advantage in water rates over those by rail, unless, indeed, Huntington should buy up the Panama Railroad opposition, when San Francisco merchants would be driven back to the two clipper lines again. The advance in rates has been from 20 to 50 per cent. and will be felt, perhaps, more in hardware, iron and metals generally than in anything else.

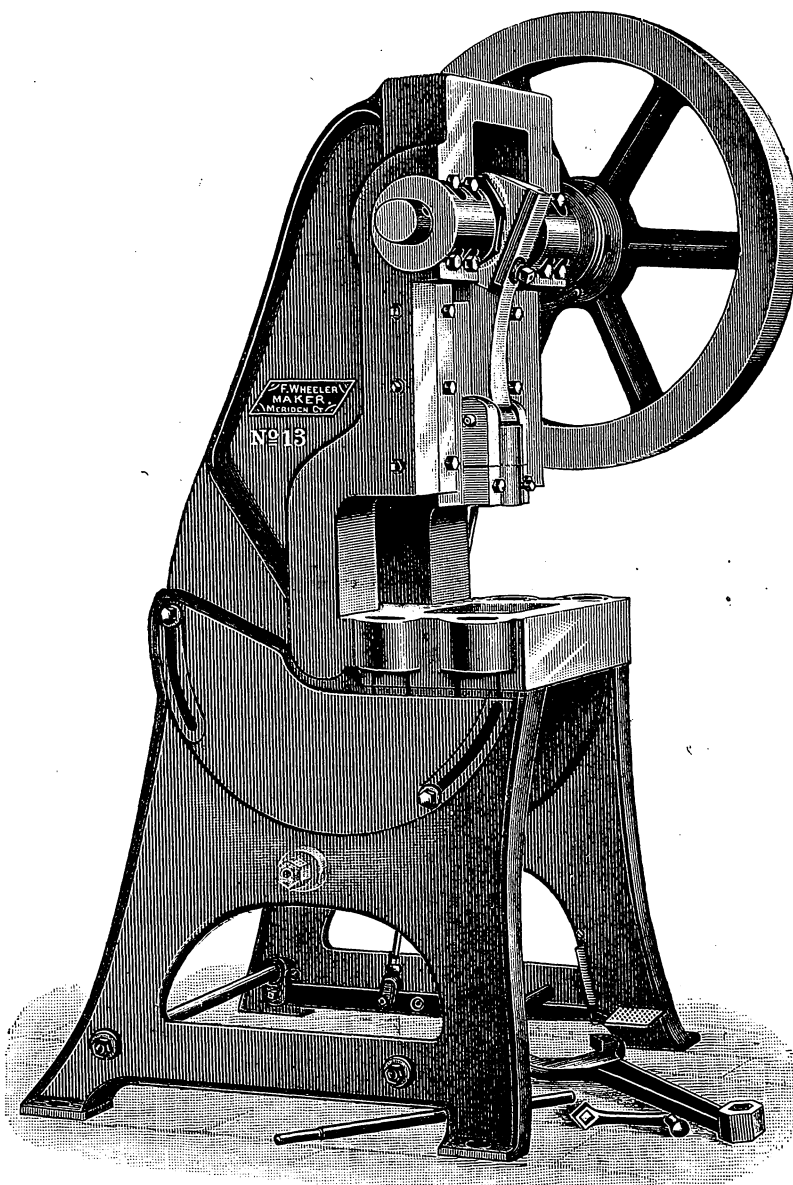
The result will not, as far as we can see at present, benefit the railroad in any respect, as the lower sea rates will continue to draw the bulk of the business that way. San Francisco has still the whip hand, although the failure of the North American Navigation Company to keep their vessels in the field is decidedly discouraging. Enough of the merchants could not be found to work together to keep the business going, although it was estimated that in one year there had been saved to the merchants and consumers, the latter principally, \$8,000,000 in freights. The year, however, was a bad one. The merchants made no money directly, the consumers seemed careless, and so the matter was allowed to fall through. The next thing in order is for Huntington to capture the Panama Railroad, and then his victory, although not complete, would be satisfying. So long as Grace & Co. keep their vessels afloat the merchants will have a cheap freight rate for all their bulky non perishable goods. In the battle which has been fought the hardwaremen were notable for their pluck and endurance. The leading spirit of the Traffic Association was one of our foremost hardwaremen, and they have fought to a successful conclusion the battle for freedom to ship American goods to European ports and transship them again to San Francisco. The suit was entitled "The United States vs. 250 kegs of nails." A couple of years ago the Dunham, Carrigan & Hayden Company shipped a large quantity of nails, hardware, &c., by a Belgian steamer to Antwerp and thence by sailing vessel to this city. This they did a great deal cheaper than they could have done by either steamer, clipper or railroad direct. The Southern Pacific at once started on the war path and contended that a foreign vessel could not carry goods between American ports, claiming that the voyage from New York to Antwerp and the transshipment to San Francisco was all one and the same transaction. Collector of the Port Phelps seized the nails. The lower court here decided against him, but it was carried to the United States Court of Appeals, which has just sustained the lower court. This opens another way to ship cheaply to this city from Atlantic ports, and the trade are correspondingly rejoiced thereat.

The bid for the completion of the dome at the new City Hall has at last been awarded, but not without exciting considerable feeling. The lowest bidders were O'Connell & Lewis, composing one of the oldest firms engaged in architectural work in the city. Their bid was \$249,700, which, after considerable discussion and angry feeling, was adopted. The firm offered to do the work for \$20,000 less if they could buy the iron and steel to be used in the work in the East. This the Board of Supervisors refused to allow, and the

this is good news to all engaged in these various lines of business. There is no special change to note in any department of this business at present and matters remain as I have previously reported.

## The Wheeler Press.

This press, built by Frank Wheeler of Meriden, Conn., is provided with an incline adjustment, consisting of a sliding box placed on top of the pitman. The solid pitman is so arranged that all



THE WHEELER PRESS.

contract was awarded on the express condition that the iron and steel used should be all California made. We have two establishments able to do all that may be needed toward supplying iron and steel and accordingly one or other of them or both will have the job of manufacturing the iron and steel to be used.

The institutions that have the chance of providing the iron and steel are the Pacific Rolling Mills and the Judson Iron & Steel Works. As work is to start right away it will give employment for some months and at good wages to several hundred men. Coming so soon after the reduction of wages at the Union Iron Works, on account of the scarcity of work there,

the strain and pressure come upon solid metal, the lower end of the pitman being seated in the solid metal of the slide or gate, and not resting upon a screw or pin. For adjusting the punch to the die it is simply necessary to turn a screw after loosening the clamping nut, when the box can be moved up or down the incline to the desired position.

The pressure at the time when the press is doing its heaviest work is brought squarely upon the end of the pitman, thereby relieving the adjusting screw and clamping nut from all strain and obviating the tendency to slip or strip the thread of the screw.

The machine is provided with a double clutch, which makes two points of contact simultaneously on opposite



sides of and in and near the center of the press shaft. This does away with the cramping and twisting tendencies usual in clutches where the contact is made at only one point. By means of an automatic brake the press is stopped gradually and easily, there being no jolt or jar. The grate is so constructed as to take up all wear automatically and is provided with a self oiling device. The machine has a positive "stop up," which is simple in construction and automatic in operation.

The King Chain Hoist.

This block has been in use for several years in many large manufacturing estab-

able, and the block throughout is of turned and fitted work. The chain is imported and tested before going into the block, and every block is tested after it is assembled. Ten different sizes are manufactured, whose lifting capacity ranges from 1000 to 20,000 pounds, the weights varying from 72 to 600 pounds and the lifts from 9 to 12 feet. The prices are from \$25 to \$340, from which a liberal discount is made. Every block is designed so that one man weighing 165 pounds can lift the maximum load of the block.

The patented features are shown in Figs. 2 and 3, which is a friction brake. Fig. 3 shows this friction brake attached to the worm shaft. It consists of a collar, *d*, fixed to the worm shaft

left against the gun metal automatically by the chain wheel when there is a load in the hook 15, which thrust produces the friction. The gun metal ring is made hollow and filled with lubricating compound sufficient to lubricate all fractional surfaces. One of the annoying features of chain hoisting blocks is the trouble which is usually had with the chain becoming stretched or worn and not engaging properly in the hoisting or windlass wheels. Special pains have been taken in the designing of this pulley to avoid that trouble, and as will be seen from the illustrations there is not only a sprocket wheel, but there are grooves in which the alternate links fit to prevent slipping or cramping.

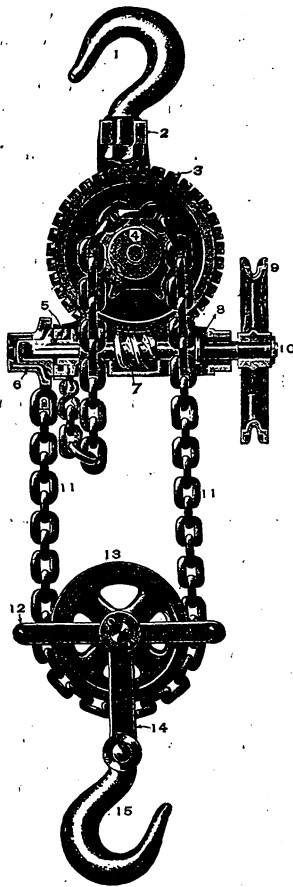


Fig. 1.—Sectional Elevation.

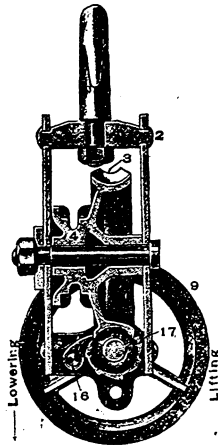


Fig. 2.

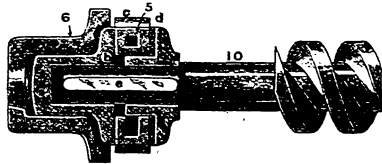


Fig. 3.—Worm Shaft and Friction Brake.

THE KING CHAIN HOIST.

lishments of Europe, including the German and British navies and the Krupp works. It was invented by a German named Luders, who holds letters patent from Germany, England, Belgium and the United States. It is now being introduced in this country by Charles G. Eckstein & Co. of New York.

The block is of the usual form, the hoisting apparatus consisting of a worm shaft that engages in the hoisting chain wheel, the shaft being turned by a small chain windlass. A special feature of the block is that all parts are of wrought iron or steel except the three chain wheels numbered 3, 9 and 13, Fig. 1. All the shafts are of steel, the worm shaft being of extra quality, case hardened. The frame is of homogeneous steel plate, and all the other parts except the wheels mentioned are of the best wrought iron. The friction rings and bearings are of gun metal, marked 5 and 8. The wrought iron parts are dropped forgings and are interchange-

able, and the block throughout is of turned and fitted work. The chain is imported and tested before going into the block, and every block is tested after it is assembled. Ten different sizes are manufactured, whose lifting capacity ranges from 1000 to 20,000 pounds, the weights varying from 72 to 600 pounds and the lifts from 9 to 12 feet. The prices are from \$25 to \$340, from which a liberal discount is made. Every block is designed so that one man weighing 165 pounds can lift the maximum load of the block.

The patented features are shown in Figs. 2 and 3, which is a friction brake. Fig. 3 shows this friction brake attached to the worm shaft. It consists of a collar, *d*, fixed to the worm shaft

**Southern Pig Iron Rates.**—The Queen and Crescent Route has issued Tariff No. 34, effective April 23, giving rates on pig iron in carload lots from Southern furnaces to points North, South and West. The rates of the principal points are given below:

| To                                 | From<br>Dayton and Rock-<br>wood, Tenn. | Chattanooga,<br>Tenn. | Rising Fawn, Ga.,<br>and Fort Payne,<br>Ala. | Birmingham dis-<br>trict. |
|------------------------------------|---|-----------------------|--|---------------------------|
| Anderson, Ind.....                 | \$2.30                                  | \$2.50                | \$2.75                                       | \$2.75                    |
| Buffalo, N. Y. ....                | 2.50                                    | 3.00                  | 3.25   | 3.50                      |
| Chicago, Ill. ....                 | 2.55                                    | 2.75                  | 3.00   | 3.00                      |
| Cincinnati, Ohio ..                | 1.55                                    | 1.75                  | 2.00   | 2.25                      |
| Cleveland, Ohio ....               | 2.30                                    | 2.50                  | 2.75   | 3.00                      |
| Columbus, Ohio ....                | 2.00                                    | 2.20                  | 2.45   | 2.70                      |
| Dayton, Ohio ....                  | 1.30                                    | 1.50                  | 1.75   | 2.00                      |
| Detroit, Mich.....                 | 2.55                                    | 2.75                  | 3.00   | 3.00                      |
| East St. Louis, Ill..              | 2.30                                    | 2.50                  | 2.75   | 2.75                      |
| Evansville, Ind.....               | 1.80                                    | 2.00                  | 2.25   | 2.25                      |
| Hamilton, Ontario ..               | 3.30                                    | 3.50                  | 3.75   | 4.00                      |
| Indianapolis, Ind....              | 2.30                                    | 2.50                  | 2.75   | 2.75                      |
| Ironton, Ohio.....                 | 2.19                                    | 2.39                  | 2.64   | 2.89                      |
| Joliet, Ill. ....                  | 2.80                                    | 3.00                  | 3.25   | 3.25                      |
| Louisville, Ky.....                | 1.55                                    | 1.75                  | 2.00   | 2.00                      |
| Milwaukee, Wis. (all<br>rail)..... | 3.00                                    | 3.20                  | 3.45   | 3.45                      |
| Muncie, Ind.....                   | 2.40                                    | 2.60                  | 2.85   | 2.85                      |
| Peoria, Ill. ....                  | 2.55                                    | 2.75                  | 3.00   | 3.00                      |
| Pittsburgh district,<br>Pa. ....   | 2.80                                    | 3.00                  | 3.25   | 3.50                      |
| Pueblo, Col. ....                  | 5.59                                    | 5.59                  | 5.59   | 5.59                      |
| St. Louis, Mo. ....                | 2.30                                    | 2.50                  | 2.75   | 2.75                      |
| St. Paul, Minn.....                | 4.50                                    | 4.70                  | 4.95   | 4.95                      |
| Springfield, Ill.....              | 2.65                                    | 2.85                  | 3.10   | 3.10                      |
| Springfield, Ohio....              | 2.00                                    | 2.20                  | 2.45   | 2.70                      |
| Superior, Wis.....                 | 4.69                                    | 4.69                  | 5.14   | 5.14                      |
| Toledo, Ohio.....                  | 2.30                                    | 2.50                  | 2.75   | 3.00                      |
| Topeka, Kan. ....                  | 5.84                                    | 5.84                  | 5.84   | 5.84                      |
| Wheeling, W. Va....                | 2.80                                    | 3.00                  | 3.25   | 3.50                      |
| Youngstown, Ohio..                 | 2.55                                    | 2.75                  | 3.00   | 3.25                      |
| Zanesville, Ohio....               | 2.40                                    | 2.60                  | 2.85   | 3.10                      |

The rates from the Birmingham district also apply to the following furnaces: Gadsden, Ala.; Anniston and Tallapoosa, Ala.; Round Mountain, Ala.; Cedartown, Etna, Hermitage and Rome, Ga.; Langdon, Rock Run and Tecumseh, Ala.; Ironaton, Jenifer and Talladega, Ala.

**The Midland Steel Company.**—A recent issue of the Muncie (Ind.) *Daily Times* contains a very interesting article relative to the operations of the Midland Steel Company. This concern have quite recently entered upon the manufacture of light sheets, having been established in the fall of 1892. Their works are of large capacity, their output the past year having been 10,000 gross tons. Notwithstanding the disturbed condition of financial affairs last summer and the dullness of general trade since then, the works have not been obliged to shut down for lack of orders since they were first started. One secret of their good fortune is probably the fact that they make an effort to supply specialties in steel sheets of fine finish and high grades, instead of

depending solely on the production of staple sizes and grades. Their sheets are exclusively made of open hearth steel, produced in their own furnaces. The enlargement of the plant is regarded as an early necessity. The officers of the company are as follows: R. J. Beatty, president, Muncie; John A. McVoy, vice president, Chicago; J. G. Battelle, treasurer, Piqua, Ohio; J. R. Wick, secretary, Muncie. The stockholders reside in Piqua and Cleveland, Ohio, Pittsburgh and Chicago. James W. Ross, room 647 The Rookery, Chicago, represents the company as sales agent for Chicago and the West generally east of the Missouri River.

## THE WEEK.

The Cataract Electric Company of Buffalo, N. Y., have closed a contract with the Niagara Falls Power Company, whereby power will be supplied for use in Buffalo about October 1.

The prolonged conflict in Brazil has at length been brought to a period. Official dispatches confirm the fact of the sinking of the insurgent battle ship "Aquidaban" by a federal torpedo boat in the harbor of Santa Catharena on April 16. Admiral Mello has given up the struggle, and, with five ships, has surrendered to and obtained asylum from the Argentine Government at Buenos Ayres. The revolutionary movement is said to have completely collapsed.

Ex-President Harrison, in concluding his course of law lectures at the Stanford University of California, gave the students some advice which is significant as coming from so competent a source. He counseled them to "stick to their profession, avoid politics and never seek office."

A shipment of 2800 tons of bituminous coal was made last week from Baltimore to Montreal, Canada, although a duty of 60 cents a ton and freight charges bring the price of the fuel considerably over that of the Nova Scotia product. Some of the Canadian manufacturers are, however, dissatisfied with the domestic coal, and it is for these parties that the present shipment, the first of its kind, has been made.

The negotiations for a proposed transatlantic steamship pool have fallen through and will not, it is said, be resumed. A rate war in steerage passenger traffic has been inaugurated between the British and Continental lines of steamers.

As the result of investigations recently made by the Commissioner of Navigation, that official estimates that Americans own and operate under foreign flags a steam tonnage equal to or greater than one-half the steam tonnage registered under the American flag.

The depression in business and the accompanying restriction of imports is clearly illustrated by a statement of Custom House receipts since the beginning of the fiscal year, published in the *Journal of Commerce*. These receipts are shown to have fallen off \$41,224,363, or nearly 40 per cent. as compared with those of the corresponding portion of the last fiscal year.

Canadian trade returns for the nine months ended March 31 show a slight decrease in both exports and imports. Exports were \$89,506,306, or \$41,000 less than in the corresponding period of last year, while the imports were

\$86,197,918, or \$825,022 less. The duty collected for the period exhibits a falling off of \$500,000.

The new truck receiving station of the Pennsylvania Railroad, in Jersey City, is of very large dimensions. It is 655 feet long and 92 feet wide. Eighty trucks can unload at once on each side of the platform.

The delay in the construction of the new dry dock at the Brooklyn Navy Yard is attracting the dissatisfied attention of the Government. It is very probable that the present contract with Mr. Gillis may be revoked, and the Government may either carry on the work itself or allow another private firm to complete the dock, which is urgently needed for the ships of the new navy.

Negotiations are, it is said, pending for uniting the independent cordage interests of the country with the United States Cordage Company.

There is a probability that the pottery troubles which have agitated Trenton, N. J., for so long may be settled by an agreement between the manufacturers and the men before the end of the present week. About 4000 operatives have been locked out in that center of the pottery trade since last January.

Ground was broken on April 18 for the work of sewerage the city of New Orleans.

The umbrella trust is reported to be in a state of disintegration. The combination was formed about two years ago with a nominal capital of \$8,000,000, and included most of the leading manufacturers. It is not, however, proving remunerative, and has not served to quell competition.

Penny in the slot machines have been put under the ban in Chicago.

Philadelphia business men complain bitterly of the disadvantages suffered by their city from the discrimination practiced by the railroads in the matter of freight rates. Concerted action will be taken by them, it is said, with a view of improving and enlarging the transportation and shipping interests of Philadelphia, which have suffered severely of late.

The Daniels Steel Railroad Tie Company of Youngstown, Ohio, recently incorporated, with a capital stock of \$50,000, have completed their organization by the election of Robert E. Daniels as president and Thomp. Burton general manager. A number of these ties have been made at the Valley mill, rolls having been manufactured and set up for the purpose. The ties are dropped after rolling into a vat filled with tar, where they remain for 24 hours, until the pores are thoroughly filled, thus preventing all trouble from oxidation and making the ties capable of very long endurance. The promoters of the enterprise are enthusiastic in their belief that the Daniels tie will supersede the wooden tie in a very short time, for it is asserted to be without the objectionable features that have been brought against ties of metal manufacture.

The Pittsburgh Bridge Company of Pittsburgh, and not the Keystone Bridge Works, have the contract for the erection of the new buildings for the Lincoln Foundry & Machine Company, under construction at Pittsburgh. These buildings will be of steel, and about 400 tons will be required.

## Another Chicago Railway Tunnel.

After four years of difficult work, involving great engineering skill, the Van Buren street tunnel in Chicago has been completed. It was delayed for some time by litigation, however, or it would have been ready for use long ere this. Although called the Van Buren street tunnel, it is not to be used for ordinary street travel, but only by the cable cars of the Van Buren street system of the West Chicago Street Railway Company. The tunnel was built under the supervision of Samuel G. Artingstall, chief engineer; C. B. Weston, resident engineer; and S. Potis, chief mechanical engineer. It passes under the south branch of the Chicago River, connecting the central part of the city with the west side, and avoids the annoying delay of crossing the river, with the traffic interrupted by the swinging bridges. It begins a long distance from the west bank of the river, burrowing under a network of 21 railroad tracks running into the Union Depot.

It passes directly beneath a seven-story and basement brick building on the west side and a six-story building on the east side of the river. In constructing the tunnel it was found necessary to take down this seven-story building and afterward rebuild it. On the east side the tunnel has a uniform grade of 10 per cent. for 499.1 feet. At the river the grade is flattened to 1.81 per cent. each way from the center, the distance being 210.86 feet. The west side of the tunnel, 487.44 feet, has a grade of 5.46 per cent. and the approach, 316.5 feet, a grade of 7.93 per cent.

To prevent accidents on the grades two heavy toothed racks have been constructed midway between slot and rails and  $2\frac{1}{2}$  inches above the surface level. In this a heavy pinion beneath the car engages, connected with a friction clutch and operated by a foot lever, placed in front of the gripman. The construction is heavy enough to stand a sudden shock without danger of breaking, and it is believed will prevent all possibility of accidents from runaway cars. A space of 5 feet exists between car and wall and artificial ventilation is unnecessary. The tunnel is a three-center arch of seven concentric rings 32 inches thick. The two outer rings are laid in asphalt mortar, giving protection against moisture on the surface of the brick work.

At the power house at Van Buren and Jefferson streets are two large Reynolds Corliss engines, 38 x 60 inches, manufactured by the Edward P. Allis Company, Milwaukee. They make 50 revolutions a minute and each develops 1250 horse-power. Only one is to be used at a time. Light for the tunnel and for the two buildings undermined is furnished by Waddell-Euse dynamos, each of 40 arc light capacity. Coupled to these dynamos are three engines, manufactured by J. H. McEwen Mfg. Company, Ridgway, Pa., a battery of six boilers of 700 horse-power furnishing the steam. The tunnel is drained by a 4 inch suction pipe equipped with a George E. Nye steam pump. The construction of this tunnel has been prosecuted almost without regard to cost, in order to make it as perfect as possible in all respects. It is much more capacious than any of the other Chicago tunnels, and avoids objectionable features which experience developed in them. Its completion has excited much interest in engineering circles.

# The Iron Age

New York, Thursday, April 26, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, - - EDITOR.  
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS, - HARDWARE EDITOR.  
JOHN S. KING, - - BUSINESS MANAGER.

## Can Prices Go Lower?

Buyers, and for that matter sellers, have apparently become so accustomed to receding prices of iron and steel that it will take a few very sharp successive advances before the spell of low values is broken. In every department of the iron trade, with one exception, goods have been sold at lower prices during the current year than ever in the history of the industry in this country. In some branches they are lower than they are in Europe. Every interest which contributes to the cost of laying down product at the door of the consumer is down to the minimum basis. Beginning with the ore, the only item in the cost sheet which has not been generally scaled down is the royalty. Profits are gone, labor is down to the lowest notch, supplies are as cheap as they ever have been, dead work is practically abandoned and railroad and lake freights are very low. In the smelting of the ore in the blast furnace coke has dropped to figures which can only be justified on the theory that powerful Connellsville interests are squeezing the minor operators into selling their property. It is stated that the makers of Bessemer pig in the Central West are earning a little money at present prices, but on all other grades of pig iron South and East producers are not getting back a new dollar for an old one.

Turning to the conversion of pig into soft steel, we find that prices are now a trifle higher than they were and the inference is generally made that the best equipped modern steel works in Western Pennsylvania are enjoying a very modest margin.

Although the raw materials, pig iron, soft steel and melting and rolling mill scrap, are all very low, and although labor is receiving wages unprecedented in the different districts, the decline in prices has kept pace with reduced cost. Wire rods, it is true, did enjoy a temporary spurt of activity and with it an advance, but now that the rush is over values are sliding back to their old level and the whole wire trade is settling back again down to bed rock.

Only the greatest mills, best located, can come out whole at present prices for beams, angles and other structural iron, plates and sheets, hoops and cotton ties, bars and nails, light and girder rails and track and car equipment.

Along the whole line raw material

and labor are squeezed to the lowest notch. Freights are down to a war basis. The pace is being set in some branches by concerns which are in the hands of receivers and who, therefore, seem to pay little attention to interest charges and renewal account.

That such a state of affairs cannot last long will be conceded by every thoughtful buyer. It is merely a question whether the time has arrived to go further than cover immediate requirements. We believe that the conviction is general that there is no danger in further delay. The prospect of months of dullness as the result of the slow progress in Washington is, we believe, the most influential factor in creating this conviction. Yet there are many buyers who acknowledge that they are skating on thin ice. It will not take much to upset the delicately poised balance upon which present low values depend. A modest increase in the demand or a restriction of the supply from the cheap sellers, leaving the market partially to those who must have more money to warrant their starting, must be naturally followed by a stiffening in prices. Against the few possible contingencies which might induce a very slight lowering in values there are so many which would tend toward establishing a reaction that the market needs the very closest watching. We have already witnessed speculative purchases of Bessemer pig iron on quite a respectable scale, and in some departments consumers have succeeded in buying for long delivery at present prices. It does not take very extensive operations of this character to make sellers shy.

Our intercourse with many of the leading men in the trade has led us to believe that very few of them, whether they be manufacturers or consumers, look forward to any marked upward movement in the next two or three months, but they do all agree that there is very little chance of a further decline. Some of them are convinced that covering for requirements well into the fall at present prices is not alone safe, but holds out the promise of making very good interest on the money invested.

Nothing better illustrates the growing dependence of the Eastern iron trade upon the West than the purchase by steel makers in Central and Eastern Pennsylvania of upward of 50,000 tons of Bessemer pig iron during the past three weeks. With freights on pig iron and steel billets equal to like points in Eastern territory, the Eastern steel works are handicapped to the extent of the waste in conversion. To illustrate with an arbitrary example, the rate on pig iron from the Valleys to an Eastern steel works may be assumed to be \$1 on pig iron, and on steel from there to the consumer's mill 70 cents. The direct freight rate from the Western mill to the consumer is, say, \$1.70. The Eastern steel maker must pay freight on an amount of pig iron which includes the waste in con-

version, or say 1.2 tons. His total freight on pig and billets therefore is \$1.20 plus 70 cents, or \$1.90, as against the Western rate of \$1.70. This is based on the assumption that the through freight is not lower than the sum of the tonnage freights of the Eastern mill, which is rarely the case. The true principle, in order to put both works on a basis of equality, would be to accept the "milling in transit" system. In former times this has been done in the barb wire trade for Western points, the raw material being foreign rods, worked in Pennsylvania mills for shipment to the interior.

## The Armies of Unemployed.

The organization of unemployed men and tramps into so-called armies to march over the country is an entirely new idea. It will hereafter be referred to in history as originating after the panic of 1893. The movement seemed insignificant at first, and Coxe's march to Washington was regarded as a joke to enliven the columns of the newspapers for a few days and was then expected to pass into utter oblivion. But the events of the last few days have put a much more serious aspect on the situation, and there is promise of enough happening to make future historians inquire closely into the causes, progress and results of this curious manifestation of unrest. At the present time there are some eight or nine "armies" struggling to reach Washington from various parts of the country. Some are moving along, making progress daily, while others are detained by local authorities who are endeavoring to break up their march, and still others are "encamped" and laying siege to railroads in the hope of securing free transportation.

In a numerical sense these "armies" form no special menace to the order and peace of the country. There are too few of them and they are too widely scattered to do much damage. They may cause annoyance to the towns through which they pass, but such towns are but a small part of the country as a whole. As long as the "commonwealers" or "industrials," or whatever they may be termed, are so few in number they can do no particular damage even if some of their leaders indulge in very foolish talk. To their credit it is to be said that they have in the main conducted themselves quietly and as law abiding citizens. But there is danger in their concentration at some point, and rendered desperate by hunger and privation no one can predict what the result might be. The occurrences at Council Bluffs, also, have shown that in large centers of population thousands of men are ready to assist them in attacking and taking possession of railroad property as though it belonged to the people at large. Experience has shown that when there are many workmen idle some join the professional loafers and hoodlums in starting

riots in large cities which cause much destruction to property. The incentive is frequently quite light. The railroad riots of 1877 would not have been so serious and disastrous if the trouble had been confined to those immediately interested. But idle workmen and the riffraff of cities, always eager for turbulence, took up the cause of the disgruntled railroaders, made common cause with them and carried the conflict far beyond the anticipation of the leaders of the original strikes.

It is unpleasant to contemplate, but there seems to be no attempt by national or State authorities to check this progress to anarchy, and the probable result will be bloodshed. This is our usual course: First, mild interest; next, toleration; next, perplexity; last, conflict and bloodshed.

During the past few years the freight traffic on our lakes has entered a new development which establishes a permanently lower rate on ore, coal and other heavy goods. It has been proven that the modern lake vessel, equipped with the latest boilers and machinery, is capable of earning good money on the investment where the older ships are running behind. In other words, the experience of freight vessels on the ocean is repeating itself, and new tonnage will have to be built, not because additional vessels are required to do the work, but because the old ones cannot be made to pay. This is another striking instance of the enormous destruction of capital as the fruit of technical progress.

**Cast Iron Pipe Rates.**—The tariff on cast iron pipe which went into effect April 2 on the Queen & Crescent Route has been followed by a second tariff, No. 9, effective April 23. To the more important points the rates are as follows:

| To                 | From | Chattanooga, Tenn. | Birmingham, Ala., and group. |
|--------------------|------|--------------------|------------------------------|
| Buffalo, N. Y.     |      | \$3.10             | \$3.60                       |
| Chicago, Ill.      |      | 2.85               | 3.10                         |
| Cleveland, Ohio    |      | 2.60               | 3.10                         |
| Columbus, Ohio.    |      | 2.30               | 2.80                         |
| Detroit, Mich.     |      | 2.85               | 3.10                         |
| Indianapolis, Ind. |      | 2.60               | 2.85                         |
| Milwaukee, Wis.    |      | 3.30               | 3.55                         |
| Niles, Ohio        |      | 2.85               | 3.35                         |
| Peoria, Ill.       |      | 2.85               | 3.10                         |
| Pittsburgh, Pa.    |      | 3.10               | 3.60                         |
| Springfield, Ohio. |      | 2.30               | 2.80                         |
| Toledo, Ohio       |      | 2.60               | 3.10                         |
| Youngstown, Ohio.  |      | 2.85               | 3.35                         |

The above rates apply to carload lots of 30,000 pounds.

It is asserted upon good authority that at present prices there is no profit attached to galvanizing steel sheets. Manufacturers are contented, perforce, with a fair profit on the black sheets and go to the trouble of galvanizing in order to find a market for the products of their mills. An effort is being made to get all galvanized iron manufacturers into the Galvanized Iron Manufacturers' Association, for the purpose of maintaining better prices, but there are a few who have not yet signified their intention and independent action continues.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., April 24, 1894.

The Tariff.

The shifting of the tariff debate from general speeches to the schedules is expected to concentrate the discussion on a line of more direct application to the interests of not only the different branches of industry but of the wage-worker. The main contest is just now directed against the income tax. If party exigencies should cause that item to be eliminated the rest of the bill would naturally be subject to very material revision in order to make up the loss from that source. The conversations of the minority managers of the bill show that they still adhere to the programme of having the fullest discussion of the schedules in all their phases.

The majority are holding conferences every day in hopes of reaching some common ground of harmonious action. If this should be accomplished it will remain to be seen to what extent it will affect the general consideration of the bill.

The organization of the wageworkers and manufacturers throughout the country is having its effect upon certain members of the majority, who begin to think that it is about time to make a halt.

Armor and Ordnance.

The Bureau of Ordnance, Navy Department, has determined to conduct tests of certain 10-inch Harveved armor plate at the Bethlehem proving grounds in the very near future, instead of having the plates brought to Indian Head for that purpose. The government testing officers from here will conduct the tests, which is expected to save time in conveying the armor here. This plate will be part of the side armor of the battle ship "Indiana," about which there is now some difference of opinion on the question of trial between the Secretary of the Navy and the builder, Mr. Cramp. The latter gentleman is anxious to have the trial of the ship take place without waiting for the rest of the armor, to which the officers of the Inspection Board object. About half of her armor is now on and the remainder is expected to be delivered by June 1. All the heavy armor is being turned out by the Bethlehem Company. The delay has been caused by the difficulty of Harveving. The total shortage of weight, of which armor and turrets are the smallest portion, is 3500 tons, for which the officers are not willing to allow the contractors to substitute lead as ballast. They do not like the precedent and say that the ballast proposed will not take the place of armor. The ship must be fully armored before her trial in order to secure the full results of an actual sea trial.

A very comprehensive tabular exhibit has been prepared at the Bureau of Ordnance, War Department, showing the number of guns required for the defense of the 27 principal ports of the United States fixed by the Board on Fortifications (Endicott Board).

It having been decided not to adopt the 14-inch and 6-inch guns, and to substitute 12-inch for 14-inch and 8-inch for the 6-inch, and not to adopt the 10 inch mortar, but substitute the 12-

inch therefor, the total required becomes as follows:

|   | 16-inch guns. | 12-inch guns. | 10-inch guns. | 8-inch guns. | 12-inch mortars. |
|---|---------------|---------------|---------------|--------------|------------------|
| Total.....  | 44            | 239           | 267           | 131          | 824              |
| Commenced.....                                      |               | 42            | 255           | 53           | 80               |
| To be completed June 30, 1894.....                  |               | 11            | 26            | 41           | 80               |
| Under process of construction June 30, 1894.....    |               | 31            | 29            | 11           | .....            |
| The Bethlehem Iron Company have contracted for..... |               | 25            | 50            | 25           | .....            |
| Will have completed June 30, 1894.....              |               |               | 1             | 2            | .....            |

Gun Carriages.

By June 30, 1894, the Ordnance Bureau expect to have completed the following gun carriages:

|                               | Com-menced. | Com-pleted. |
|-------------------------------|-------------|-------------|
| 8-inch non disappearing.....  | 8           | 8           |
| 8-inch disappearing.....      | 1           | 1           |
| 10-inch non disappearing..... | 5           | ..          |
| 10-inch disappearing.....     | 4           | 4           |
| 12-inch non disappearing..... | 5           | 4           |
| 12 gun lift.....              | 4           | 1           |
| 12-inch mortar.....           | 80          | 80          |

The builders of the 12 inch mortar carriages are the Builders' Iron Foundry, Providence, R. I.; Robert Poole & Son Company, Baltimore, and the West Point Foundry Company.

On June 30, 1894, the amount of oil tempered and annealed steel on hand and contracted for will be: Sets of forgings for 31 12 inch, 29 10-inch and 11 8-inch guns.

The army ordnance work of late has been carried on with exceptional vigor at Sandy Hook.

The work on gun carriages for the heavy caliber of seacoast defense guns is beginning to show results. The four types are the 10-inch Buffington-Crozier disappearing carriage, largely operated on the counterpoise principle. This carriage has been completed at the Southwark Foundry & Machine Company, Philadelphia, Pa.

The Gordon 10-inch disappearing carriage, operated on the pneumatic principle, is also going through some important experimental tests. The gun lift carriages for 12-inch guns are on the Abbott principle. This carriage has an automatic arrangement of its hydraulic cylinders to retain the gun in its recoiled position after firing. The last type is the pneumatic disappearing gun carriage operated by compressed air.

The report of Gummey, Spering & Co., Philadelphia, Pa., to Special Agent Ira Ayer of the Treasury Department, respecting their output of tin plates for the quarter ending March 31, 1894, gives the following figures:

|  |           |
|--|-----------|
| Total make tin and terne.....              | 1,116,330 |
| Tin plates.....                            | 214,296   |
| Terne plates.....                          | 902,034   |
| American black plates.....                 | 898,431   |
| Foreign plates.....                        | 217,899   |
| Tin under 63 lbs. per 100 square feet..... | 213,453   |
| Terne plate all under 63 lbs.              |           |

The firm of Gummey, Spering & Co. began making plates early in 1892 and have not stopped except a few days for repairs since then. A particularly gratifying fact in the above report is the great amount of American black plates, more than three-quarters of the total product being of American origin and only 218,000 pounds of foreign plates.

## CORRESPONDENCE.

**The Hawdon & Howson Furnace.**

To the Editor: In your issue of April 19, 1894, you describe the Hawdon & Howson furnace for making pig iron. This arrangement was designed by us in 1880 to use soft coal exclusively, and is patented. See patent No. 228,528, June 8, 1880. TAWS & HARTMAN.  
PHILADELPHIA, Pa., April 19, 1894.

## OBITUARY.

CHARLES H. ALEXANDER.

Charles H. Alexander died in Philadelphia on the 18th inst. Mr. Alexander was a member of the firm of Alexander Bros., manufacturers of leather belting, 410-412 North Third street, Philadelphia. He was born in 1839 in New Hampshire, and came to Philadelphia in 1868 with his brothers. He was well known in the leather and belting trades, and was a highly respected citizen. At a meeting of the leather and belting trades held at the Harris Club in Philadelphia on the 20th inst., a minute of respect was entered and a committee appointed to attend the funeral service.

WALDEN EDDY.

Walden Eddy died at Greenwich, Washington County, N. Y., April 14. He was the father of many successful enterprises. He established the famous Eddy Plow Works. He was born in South Corinth, N. Y., November 17, 1807. After leaving school he commenced the foundry business, continuing in Corinth until 1835, when he removed to Greenwich, where he embarked in the same line. He entered into a partnership with Martin Dyer, who afterward retired and was succeeded by Abram Reynolds. Samuel Langdon was then admitted as a partner and the firm conducted business under the name of Eddy, Reynolds & Langdon. Later Mr. Eddy bought out his partners, and in 1881 took his sons into partnership.

ALEXANDER H. HOOVEN.

Alexander H. Hooven, for a number of years a member of the firm of James Hooven & Sons, iron manufacturers at Norristown, Pa., died at his home in that city on the 22d inst. of neuralgia of the heart. He was born in 1838 and in 1853 became connected with his father in the rolling mill at Norristown. Subsequently the large blast furnace, afterward leased to McHose & Son, and later the manufacture of iron pipe engaged the attention of the firm. In 1889 he joined with J. P. Masin in establishing the manufacture of washers at Norristown, returning in 1891 to become the superintendent of the works of James Hooven & Sons.

An interesting contention between the Shelby Steel Tube Company of Shelby, Ohio, manufacturers of cold drawn tubes used in bicycle manufacture, and the United States Government was decided by Judge A. J. Ricks in United States Circuit Court, Cleveland, on Monday, April 16. The company named, of which David L. Cockley is president, began importing hollow billets from the island of Sandviken, Sweden, in the fall of 1891. On the first lot imported the question was raised as

to the rate of duty to be paid under the McKinley act. Collector Gary of Cleveland held that the rate should be 1 $\frac{1}{10}$  cents per pound. The importer claimed that the material was dutiable at \$22 a ton, or a difference of about  $\frac{1}{10}$  cent per pound. The United States board of general appraisers at New York sustained Collector Gary. An appeal was taken to the United States Circuit Court and Judge Ricks has just decided in favor of the Shelby Steel Tube Company.

## The Coal Production of the United States

E. W. Parker, statistician of the United States Geological Survey, has issued the following preliminary statement of the production of coal:

| 1893.                        | Product.<br>Short tons. | Value.        |
|------------------------------|-------------------------|---------------|
| Alabama.....                 | 5,138,693               | \$5,111,583   |
| Arkansas.....                | 574,763                 | 773,347       |
| Colorado.....                | 3,677,526               | 4,605,939     |
| California.....              | 72,608                  | 167,565       |
| Georgia.....                 | 372,740                 | 368,972       |
| Illinois.....                | 19,949,564              | 17,827,595    |
| Indiana.....                 | 3,721,751               | 3,977,425     |
| Indian Territory.....        | 1,252,110               | 2,148,637     |
| Iowa.....                    | 3,931,026               | 5,072,763     |
| Kansas.....                  | 2,553,641               | 3,184,650     |
| Kentucky.....                | 3,005,010               | 2,610,973     |
| Maryland.....                | 3,651,431               | 3,209,719     |
| Michigan.....                | 45,979                  | 82,462        |
| Missouri.....                | 2,897,423               | 3,560,599     |
| Montana.....                 | 913,460                 | 1,836,073     |
| New Mexico.....              | 601,145                 | 948,748       |
| North Carolina.....          | 17,000                  | 25,500        |
| North Dakota.....            | 49,580                  | 56,150        |
| Ohio.....                    | 13,140,770              | 12,257,794    |
| Oregon.....                  | 41,883                  | 164,500       |
| Pennsylvania.....            | 44,098,053              | 35,208,473    |
| Tennessee.....               | 1,908,974               | 2,057,977     |
| Texas.....                   | 302,136                 | 688,287       |
| Utah.....                    | 413,205                 | 611,062       |
| Virginia.....                | 813,568                 | 684,623       |
| Washington.....              | 1,264,877               | 2,920,876     |
| West Virginia.....           | 10,619,985              | 8,225,312     |
| Wyoming.....                 | 2,439,311               | 3,290,904     |
| * Total bituminous.....      | 127,498,212             | \$121,671,009 |
| Pennsylvania anthracite..... | 53,950,400              | 85,684,465    |
| Totals.....                  | 181,448,612             | \$207,355,474 |

\* Includes small anthracite production of Colorado, New Mexico and Virginia.

The figures quoted above include an allowance for country banks. The returns differ materially from the estimate made by the *Engineering and Mining Journal*, which was 850,000 tons too high for Indiana, 1,000,000 tons too low for Illinois, 500,000 tons too high for Kansas, 400,000 tons too high for Missouri, 1,400,000 tons too high for Ohio, over 1,000,000 tons too high for Pennsylvania bituminous coal and about 1,750,000 too low for West Virginia.

The Stability Board, composed of several of the ablest officers in the navy, have filed their report upon the battle ship "Indiana" and her sister vessel. The report completely vindicates the design of the ships, and shows that the great weight of armor and armament can be carried by them with ease. With only 10,000 tons displacement the "Indiana" has a battery equivalent to that of the great 14,000-ton ships now building for Great Britain, and she is a more formidable vessel than any of her size in the world. The metacentric height, measuring the stability of the ship, was found by actual tests to be within an inch of what was intended when the design was made, or 3 feet 4 $\frac{1}{2}$  inches. It is said that the accuracy of the calculations made has been verified in a most remarkable degree, the board demonstrating that the vessel draws exactly 24 feet, as it was designed to do, and that with 400 tons of coal aboard the total weights differ from the estimated by only two-thirds of 1 per cent. The

result is naturally very gratifying to the Department and to the public in general.

## PERSONAL.

A. J. Forbes-Leith of the Illinois Steel Company has returned to Europe.

Eckley B. Coxe is spoken of as a Democratic candidate for the Governorship of Pennsylvania. Should he allow his name to be put forward, Mr. Coxe would, says the *Harrisburg Patriot*, reunite and strengthen the Democratic party as few other men in the State could.

Lieutenant Naoki Miyaoka of the Imperial Japanese Navy, temporarily attached to the Japanese Legation, is in this country for the purpose of studying American methods in the construction of war ships and armor plates, with the object of using his information for the benefit of the new Japanese Navy. Lieutenant Miyaoka was at Bethlehem, Pa., last week, where he inspected the armor plate and gun works. The Japanese Navy, he stated, consists at present of 40 efficient war vessels, and plans are shortly to be drawn for the construction of two battle ships of the "Indiana" and "Massachusetts" type.

The demoralization in the cast iron car wheel trade is well illustrated by the fact that some car wheel manufacturers are offering railroads to furnish them with a new wheel for each two old wheels delivered to them. Since old wheels are offered to car wheel makers openly at \$9 per ton, the low prices which are made on new stock may be readily figured.

The labor troubles in the Chicago building trades are now in promising shape for early settlement. Some of the leaders in the lockout by employers are changing their attitude and propose to resume work on partly completed buildings. Their differences with their workmen are gradually disappearing. Concessions are being made by both sides. The most stubborn fight appears to be among the plumbers, as the journeymen positively refuse to accept the terms offered by the master plumbers. The latter are endeavoring to resume operations with non-union workmen drawn from outside points. Everybody is hopeful, however, that the struggle between the plumbers will not be protracted, but that the difficulty may be arbitrated. An unfortunate effect of this controversy has been the indefinite postponement of many building enterprises projected this spring in Chicago.

The Pittsburgh Sales Agency, J. H. Hillman, manager, 8 Wood street, Pittsburgh, Pa., announce that they have for sale at very low prices Bessemer steel works, structural steel mills, also steel plant for rolling bars and cold rolling, and an interest in a tin plate plant located in Indiana. The further announcement is made that this agency have for sale some very desirable coal properties, improved and unimproved.

Earl C. Bacon, formerly of the firm of Copeland & Bacon, New York, has located in the Havemeyer Building as an expert consulting and erecting engineer.



## MANUFACTURING.

### Iron and Steel.

At this time Furnace No. 1 is the only stack in operation at the plant of the Pennsylvania Steel Company, Steelton, Pa. The other three stacks are undergoing repairs.

Last week a serious explosion occurred at Furnace D at the Edgar Thomson Works, Bessemer, Pa., entailing a loss of about \$25,000. The stack will be idle some time while necessary repairs are being made.

Last week every department of the plant of the Brown, Bonnell Iron Company, Youngstown, Ohio, with the exception of No. 1 mill, was in operation. It is stated that this firm have secured quite a number of large orders, and expect to operate their plant to fuller capacity from now on than has been the case for some time past.

Work is being rapidly pushed on the tin mills at the Aetna-Standard plant, Bridgeport, Ohio. The machinery has commenced to arrive and it is expected that operations will be commenced in from 60 to 90 days. The first mills built will be experimental, and if the venture proves successful several more will follow. The old puddling department of the Standard plant has been entirely cleared and the building will be used as a tinning house. This arrangement concentrates the tin plate operations, as the tin mills are being erected where the Aetna plate mill formerly stood, directly opposite the Standard puddling department. Many other improvements are going on at this already extensive plant, and an increase in the capacity of the galvanizing shop is under consideration. During the past few weeks the Aetna-Standard mills have been operated more steadily than at any time since work was resumed last fall.

The Penn Iron & Coal Company, Canal Dover, Ohio, are contemplating making considerable improvement in their blast furnace.

The implement manufacturers of Moline, Ill., are discussing the expediency of erecting a rolling mill there to supply the several establishments with a large part of the material now purchased from mills at a distance.

The Muncie Iron & Steel Company have started their new merchant mill at Muncie, Ind.

It is understood that the rolling mill of the Ohio Steel Company now building at Youngstown, Ohio, will be arranged so that steel rails as well as billets can be made.

Fruitless efforts have been made to induce the Racine Malleable Iron Company to remove to other localities, but they have decided to remain at Racine, Wis., and will rebuild the plant which was recently destroyed by fire.

The machinery for the new plant of the Minneapolis Iron Rolling Mill Company, according to a local paper, has been tied up at Pittsburgh awaiting orders for its shipment, which will not be given until the iron market picks up sufficiently to warrant the starting of the mill. If this should come within two weeks, it is thought the mill can be started June 1. At first its chief work will be the reduction of scrap iron to commercial bar, after which a car axle and link and pin plant will be put in.

Receiver Robert Kelly expects to be able to put in operation the plant of the West Superior Iron & Steel Company, at West Superior, Wis.

The rolling mill department of the Duluth Mfg. Company, at Duluth, Minn., will be started up shortly with the usual number of hands. The company are receiving orders for rolled iron and the mills will be put to work to make up stock for the general market. How long the plant runs will be determined by the amount of orders secured.

The building now under erection by the Canton Rolling Mill Company, Canton, Ohio, is rapidly approaching completion, and is expected to be finished about July 1 next. The new concern will engage in the manufacture of iron and steel sheets and expect to turn out from 25 to 35 tons per day. The building is of iron and is being erected by the Canton Bridge Company of Canton, Ohio. The rolls are being furnished by the Lloyd Booth Company of Youngstown, while Wm. Tod & Co. of the same place will supply the engine, and Reeves Brothers of Alliance, Ohio, have the contract for the boilers.

The Falcon Iron & Nail Company of Niles, Ohio, have filed a petition in the Common Pleas Court, at Trumbull, Ohio, to enjoin the City Council of Niles from issuing \$10,000 worth of bonds for establishing a new sheet mill.

At a meeting of citizens of Blairsville, Pa., held in that place last week, it was decided to take up the question of building a tin plate plant. The new concern will be known as the Pennsylvania Rolling Mill & Tin Plate Company, the authorized capital stock to be \$250,000, divided into 5000 shares, having a par value of \$50 per share. A committee was appointed to perfect the necessary arrangements looking to the erection of the plant.

The Linden Steel Company of Pittsburgh, manufacturers of open hearth and Bessemer steel, are running their plant to nearly full capacity. Their sheet mill, 10-inch mill, machine and blacksmith shops are running double turn.

A meeting of stockholders of the Oliver Iron & Steel Company was held in Pittsburgh last week for the purpose of considering an increase of the capital stock of the concern and to make an issue of preferred stock.

Claire Furnace of the Claire Furnace Company, Limited, at Sharpsville, Pa., was put in blast last week after an idleness of some months.

The entire plant of the Lockhart Iron & Steel Company, at McKees Rocks, Pittsburgh, manufacturers of merchant bar iron and steel, is in operation to full capacity.

All departments of the plant of the Keystone Rolling Mill Company of Pittsburgh, manufacturers of iron and steel skelp, are in full operation, with the exception of the plate mill.

The men employed in the bar mill of A. M. Byers & Co., at Pittsburgh, have accepted a reduction of 10 per cent. in wages.

The latest report in regard to the rolling mills operated for a short time a few years ago by the Joliet Sheet Steel Rolling Mill Company, Joliet, Ill., is to the effect that the property has been sold to Jacob James of New Castle, Pa., formerly manager of the Arethusa Iron Works, and his brother Henry James of Cleveland, Ohio; the consideration being less than one-half the cost of the plant.

Men are at work preparing for the erection of new buildings for the Whitaker Iron & Steel Company, Wheeling, W. Va., and material has commenced to arrive. The report that N. E. Whitaker will engage in the manufacture of tin plate at Washington, Pa., is not yet an assured fact. The project depends upon the settlement of some very important negotiations now pending.

The semi-monthly pay roll at the Pennsylvania Steel Company's Works, Steelton, Pa., amounted on Saturday last to \$64,000, the largest in many months.

The 14 and 20 inch trains in the merchant mill of the works of the Burden Iron Company, at Troy, N. Y., were idle last week. The new horseshoe department is in operation, as well as two machines in the old department.

The puddlers at the Albany Iron Works, Troy, N. Y., started to work last week, and they had only been engaged a few hours when they were obliged to cease on account of a break in the big iron pipe leading to the tank which furnishes the supply to the mill. Repairs were speedily made, however, and operations were resumed.

Suits to foreclose mortgages amounting to \$132,000 against the Maumee Rolling Mill Company and John E. Mosher of Toledo, Ohio, have been brought by James Secor and Thomas H. Walbridge, trustees.

The rolling mill of the Logan Iron & Steel Company at Lewistown, Pa., has been burned.

The Columbia Rolling Mill Company, Columbia, Pa., recently resumed work with 200 hands after some months' idleness. A few days later when a reduction of 25 cents a ton for puddling was announced, bringing wages down to \$2.50 a ton, the men struck and the mill was again idle.

Part of the works of the Marshallton Iron Company, at Marshallton, Del., have started up.

Topton furnace, at Topton, Berks County, Pa., will be blown out about May 1 and sold, in order to settle the estate of the late Henry S. Eckert, who was a partner with his son, Isaac Eckert, in the management of the plant. The furnace has been a suc-

cessful one, but will, it is said, require extensive repairs before relighting.

No 2 Sheridan furnace, Wm. M. Kaufman & Co., Sheridan, Pa., is being relined, and will probably be blown in about the middle of next month. Other improvements are also under way about the plant.

The Ontario rolling mills, at Hamilton, Ont., have started up in full, with the prospect of a continuous run.

We are advised by E. D. Reis, manager, that the report that the Rosena furnace at New Castle, Pa., had blown out for the purpose of relining is erroneous. The furnace was coked down on account of a strike, but will start up again during the present week.

The E. & G. Brooke Iron Company of Birdsboro, Pa., have posted a notice of a 10 per cent. reduction in their nail works, taking effect May 1.

The plant of the W. Dewees Wood Company, at McKeesport, Pa., has shut down indefinitely.

The plate mill of Potts Bros. Iron Company, Limited, Pottstown, Pa., has started up. It is stated that sufficient orders are on hand to keep the mill busy for some time to come.

The workmen of the Northeast Works of the McCullough Iron Company, Northeast, Cecil County, Md., went on strike because they were dissatisfied with the wages they were receiving, but when told that the works would be closed indefinitely they accepted the old rate and returned to work.

The Dora Furnace Company at Pulaski, Va., are erecting a brick foundry, 40 x 100 feet in size. The foundry will utilize a portion of the furnace product.

The Benwood, Ohio, plant of the Wheeling Steel & Iron Company has been equipped for the manufacture of steel skelp.

The plant of the Brown, Bonnell Iron Company, Youngstown, Ohio, which was in full operation last week, will be idle in some departments during this week. On Monday, the 23d inst. this firm commenced to reline Phoenix furnace preparatory to putting it in blast.

### Machinery.

The Chicago Great Western Railway Company have decided to establish their machine shops at Oelwein, Iowa. The magnitude of the shops can be estimated from the fact that a land company will expend \$200,000 in their erection to induce the company to locate at that point.

J. W. Vaness has made arrangements to build a foundry and machine shop at Albert Lea, Minn.

Charles J. Newcomb has purchased the old Ogden plow works plant at Cedar Rapids, Iowa, and removed thither his foundry and machine shop from Parnell, Iowa. A portion of the establishment he has rented to J. Mullin, lately of Minneapolis, who will manufacture boilers.

The effects of the late Rice & Whitacre Mfg. Company, 47 South Canal street, Chicago, have been purchased by the Rice Engine & Boiler Company, who will continue the business of manufacturing engines, boilers, &c.

The Rice Machinery Company, 168 South Clinton street, Chicago, are offering the trade packing of various kinds, of braided flax and with gum core. Their braided flax packing is branded with an arrow and is used more particularly for water pumps and hydraulic elevators, but is also a good steam packing. Their Red Cross piston packing is made with both round and oval core. Their Skull and Bones steam piston packing has been made to fill a demand from engineers for the best packing that can be produced without regard to cost, and is made of the best cotton fiber on a round rubber core. The company also offer asbestos cold water paint for whitening walls and ceilings in factories, warehouses, sheds, &c., which is put up in powder form and is ready for instant use by simply mixing with cold water.

The Dodge Mfg. Company have just opened an Eastern branch at 43 and 45 Dey street, New York, for the sale of their power transmission machinery. Their Chicago branch is located at 166 to 174 South Clinton street. It is their intention to carry in these two warehouses the largest stock of shafting, hangers and wood split pulleys to be found in any house in the same line of trade. It will be remembered that this company secured the contract for supplying the late World's Fair at Chicago with shafting, hangers and wood split pulleys,



the outfit calling for some 400,000 pounds of material. They are preparing and now have in press a new catalogue. It will be ready for distribution about the middle of May. The company's works and main office are at Mishawaka, Ind.

Hon Lewis Miller of Akron, president of C. Aultman & Co., Canton, Ohio, manufacturers of agricultural machinery, which concern went into the hands of a receiver some months since, has made a proposition to the creditors of that firm and a similar one to the creditors of the Akron Iron Company, Akron, Ohio, of which concern Mr. Miller is also president, and being the principal indorser for both companies. He proposes to assign to the Savings & Trust Company of Cleveland, Ohio, in trust for creditors of C. Aultman & Co., \$319,000 worth of stocks and securities owned by him in Aultman, Miller & Co.; in Akron, Whitman & Barnes Mfg. Company; First National Bank of Canton, and other corporations, to be held in trust for three years. If the indebtedness of C. Aultman & Co. is not satisfied at the expiration of that time, the securities to be sold in Cleveland by the creditors' committee for the benefit of the creditors of C. Aultman & Co. In the mean time Mr. Miller asks \$5000 a year in dividends from these securities. His proposition to the creditors of the Akron Iron Company, which is in the hands of J. A. Long as receiver, is to assign in trust \$150,000 in stock and real estate on like conditions to the above. From these he asks that he receive \$2000 of each year's dividends. The assets of C. Aultman & Co. when the receiver took charge were \$1,900,000 and the liabilities about \$1,500,000. The proposition of Mr. Miller has been favorably received by a number of leading creditors, and it is believed that it will go into effect, thus facilitating a reorganization of both concerns.

The Enterprise Mfg. Company, Columbiana, Ohio, have just completed the erection of a 15-ton steam street roller which has been given a partial trial with very satisfactory results. The firm claim a number of improvements in this roller, one of the most important of which is the steam steering device.

Located at Washington, Pa., are a number of concerns engaged in the manufacture and sale of boilers and oil well supplies in general. A recent visit to that place showed that these concerns were all enjoying a fair trade and were operating their plants to nearly full capacity. Davin & McClure, manufacturers of oil well supplies of all kinds, are running to nearly full capacity. The same is true of the Petroleum Iron Company, whose specialty is the manufacture of oil well boilers. Fink, Lane & Fink, manufacturers of oil well supplies, are also employed to nearly full capacity, as is Geo. W. Rose, whose machine shops were recently burned down but have been rebuilt on a larger scale.

The Hall Signal Company of Maine filed a bill in equity in the United States Circuit Court at Pittsburgh last week against the Union Switch & Signal Company of that city. It is alleged the defendant company have been using a certain circuit controlling a device for which the plaintiff holds the sole right by purchase from the inventor, J. P. Buchanan. An injunction and damages are asked for.

William Schleicher, Jr., of the Troy Malleable Iron Company, Troy, N. Y., has leased the Daniel E. Paris Foundry at West Troy, N. Y. He intends to utilize the foundry for the manufacture of iron specialties. He has begun repairs and hopes to have them completed so that he may commence operations in about three weeks. The Standard Scale Company, now located at Kingston, N. Y., will occupy a portion of the plant. The Paris Foundry has been idle about a year.

The Chicago branch of Henry R. Worthington, manufacturer of the Worthington steam pumps, condensers and water meters, has been removed from the corner of Lake and Dearborn streets to 185 to 189 Van Buren street.

The Cincinnati Milling Machine Company, Cincinnati, Ohio, refer to the condition of business with them as being fairly satisfactory. They are now running on full time. They have received so far this month four cable orders for millers and grinders.

The Laidlaw-Dunn-Gordon Company, at Tweedvale, 9 miles from Cincinnati, just beyond Ivorydale, have started work on their new shop. The present plant of the company in Cincinnati is to be removed to

the new suburb, as is also the Gordon Pump Works at Hamilton, Ohio. The main machine shop will be the first building erected. It is to be 660 feet long and 113 feet wide and 65 feet of one end is to be three stories high. It will cost \$120,000. East of this main building will be the iron foundry, pattern shop, brass foundry, blacksmith shop, &c. The total cost of the plant, with residences, will be \$700,000. It is expected that \$300,000 will be spent this spring.

The workmen employed by the Phoenix Iron Company of Trenton, N. J., have applied to the court for the appointment of a receiver of the company, alleging that wages amounting to \$2000 are due them.

John L. Bogart, who manufactured turret machines, lathes, milling machines and special machinery at Flushing, L. I., has closed his works indefinitely.

The A. A. Griffing Iron Works of Jersey City, N. J., have shut down, anticipating a strike by their 250 employees, who demanded the restoration of a reduction of 10 to 20 per cent. in wages made last December.

After an idleness of five months the North Reading Foundry, at Reading, Pa., have started up in full, employing 160 hands.

Chambers Bros. & Co., Philadelphia, will erect a one-story steel and brick foundry building, 80 x 50 feet in size, at Fifty-second and Media streets.

The Cordele, Ga., machine shops and planing mill have been burned at a loss of \$30,000.

The loss sustained by the burning of the cast iron pipe works of the Glamorgan Company, at Lynchburg, Va., is now placed at \$100,000, the insurance being \$65,000. Nine buildings were destroyed, including the foundry and machine shop. The fire is supposed to have originated in the cupola of the foundry. The works will be rebuilt with all possible haste, it being the intention to erect more substantial structures than the ones burned.

The Williamsport Valve & Hydrant Company of Williamsport, Pa., have just entered upon their second year of establishment, and are meeting with a good demand for their products. Their valves are of the straightway pattern, with double gate and parallel seat. The wedging parts are constructed in such a manner as to insure a very quick release and a consequent removal of strain from the spindle. They are described as working well in any position, upright, upside down or flat, an important feature in heavy valves. The spindles and bearings in all valves are of brass, and on screw socket valves 8-inch and larger companion flanges are used. The company state that it is not their intention to compete in price with cheap goods, but they will aim to produce a first-class valve, embodying high quality of material and workmanship, at as reasonable a figure as possible. The valves are made, under patents owned by the company, in brass from  $\frac{1}{4}$  inch to 3 inches and in iron 2 inches upward. The company's plant is conveniently located in a well lighted new brick building situated on the outskirts of the city of Williamsport, and sidings from the Pennsylvania and Philadelphia & Reading railroads run into the works. Their foundry is 45 x 60 feet and their machine and finishing shop 45 x 128 feet, while their engine and boiler room, pattern and store rooms are of ample size and well arranged. Their site covers 4 acres, and the sand used in their foundry is found on their property in inexhaustible quantity. Their machinery is of the newest type and selected especially for their class of work. They furnish employment for about 50 hands at present, but state that they are augmenting their force almost weekly. They are about to commence the erection of an extension to their main building, 45 x 100 feet, to be used as a stock room.

E. D. Jones, Son & Co. of Pittsfield, Mass., will erect a new machine shop. The structure will be about 100 feet long and three stories high.

The Tamaqua Mfg. Company of Tamaqua, Pa., are about to move their plant to a new site not far from their present location. They will commence the erection of a frame building on the new site very shortly, to contain the foundry, machine shop and office. They will utilize their present foundry building as soon as it can be removed to the new site as a blacksmith shop and cleaning room. They will add considerably to the equipment of their machine shop, and will put a new cupola

and crane in their foundry. The company make a specialty of the manufacture of coal mining machinery.

#### Hardware.

The Reliable Edge Tool Works of Indianapolis, Ind., are preparing to build new works on a more extensive scale.

A six-story building is being erected on Wormwood street, South Boston, Mass., by the Boston Ferrule Company. The building will be constructed of brick. It will be 75 x 200 feet.

The Wright & Colton Wire Cloth Company, Worcester, Mass., are now running from 240 to 250 hands in all departments, and operating nearly all departments night and day, turning out some \$1700 worth of goods daily and having a weekly pay roll of nearly \$2000. The erection of a 25 x 65 foot two story addition to the galvanizing plant will be commenced soon. The wire mill department is now turning out something like 200 tons of wire per month.

Buffalo Tricycle Company, Buffalo, N. Y., write us that their business is fully up to that of last year for the same period. They state that their goods are being very favorably received, referring to the fact that there is a large demand for a first-class, fully guaranteed, high grade, medium priced bicycle. They are still making large quantities of tricycles.

Hubbard & Co., Pittsburgh, Pa., manufacturers of shovels, spades, scoops and drain tools, advise us that trade with them is in a very satisfactory condition. During the last six months this concern have operated their entire plant to full capacity. They report a specially large demand for their oil tempered railroad shovels, which are said to be in use by railroads all over the United States.

At the annual meeting of the stockholders of the Yale & Towne Mfg. Company, held on April 19 at the company's office at Stamford, Conn., the following gentlemen were re-elected directors for the ensuing year: Henry R. Towne, Schuyler Merritt, George E. White, M. F. Merritt, Walton Ferguson and Wm. F. Donovan, all of Stamford, and Thos. F. Keating of New York. At a subsequent meeting of the directors the following officers were elected: Henry R. Towne, president; Schuyler Merritt, secretary; George E. White, treasurer; Thos. F. Keating, assistant treasurer; William F. Donovan, general manager.

The Champion Self-Heating Flatiron Company of Kansas City, Kan., and Kansas City, Mo., have been incorporated with a capital of \$250,000. The directors are R. E. Ela, C. I. Lee and W. A. Griswold of Kansas City, Kan., and S. W. Dowling, J. O. R. Campbell, N. W. Brandon and A. G. Brandon, of Kansas City, Mo.

The Brady Edge Tool Works, Lancaster, Pa., which have been running for several months on short time, began on the 23d inst. to work full time, ten hours per day, with a full force of men.

The William Lang Company, 123-139 Middleton street, Brooklyn, N. Y., have re-organized and strengthened themselves by taking in several individuals long connected with the E. P. Gleason Mfg. Company, including E. F. Gennert, formerly second vice-president, and superintendent F. W. Belmont, secretary, and J. F. Cunningham, assistant superintendent, all of whom have been with the above named concern for many years. The Lang Company are manufacturing gas and electric supplies, machine made fittings and trimmings, including argand and gas burners, electric and gas sockets, holders and a general line of parts for concerns manufacturing electric and gas fixtures.

#### Miscellaneous.

The employees of the Passaic Zinc Works, at Jersey City, N. J., have been notified that the 10 per cent. reduction taken from their wages last December will be restored to them on May 1.

Among recently authorized corporations in Illinois is the Illinois Reaping & Mowing Machine Company, at Chicago; capital stock, \$300,000; incorporators, George E. Shipman, Daniel Lauterman and John J. Kelly. Winslow Brothers Elevator Company, at Chicago; capital stock, \$100,000; incorporators, Francis A. Winslow, Edward O. Brown and George Packard.

In the courts at Pittsburgh this week, Mackintosh, Hemphill & Co., Limited, of that city, secured a verdict for \$6585.10 against Charles H. Reed, an action on a note.

## The Iron <sup>AND</sup> Metal Trades.

The labor troubles are the principal element of uncertainty in the situation at the present writing. The general strike of the Bituminous Coal miners affects the finishing mills chiefly by cutting off their supply of fuel for the heating furnaces and in some cases for the boilers. The railroads are apparently seizing promptly the consignments of fuel to their customers and withhold the Coal for their own use.

The miners in the Connellsville region seem to be carried along by the general movement, and the situation there is regarded as more serious, from the standpoint of a supply of Coke for the near future, than it has been thus far. Any stoppage even though it be brief would quickly tell on the furnaces and Steel works of the Central West because old stocks of Coke have been very much reduced during the recent troubles. Any unfilled orders which might be thrown upon the market by customers of the Western mills could be readily taken care of by the Eastern works at a price.

The strike in Alabama would influence quite different interests if established and continued. It would touch the founders throughout the country. As yet all the furnaces in the Birmingham district are running and the chances seem to be against the men, many of whom recognize that since there has been no change in wages in the last five years, in spite of the enormous shrinkage in the price of Pig Iron, a reduction is a necessity.

A lull has followed the very large purchases of Bessemer Pig Iron in the West, which had left the market stationary until fears of a coke strike began to create some uneasiness. Billets are firmer and are held at \$15.75, Pittsburgh, for the lowest sellers. Buyers, however, are pretty well covered for the present.

There seems little doubt that, generally speaking, the mills in the Pittsburgh and outlying districts are not as eager sellers as they have been. The result is that, with relaxing pressure from that quarter, the Eastern mills are picking up more business. Prices, however, continue at the very lowest notch.

One of the interesting transactions of the past week has been the closing of an 85-mile Wrought Iron Pipe contract for the natural gas belt at Lafayette, Ind. A works on the Delaware River has captured the lion's share of the order, from 50 to 55 miles, while the balance is taken by Pittsburgh. Eastern Pennsylvania mills are to furnish the material for that part of the order which goes to their section.

Chicago reports that the local Steel Rail mills have orders assuring work well into fall. From St. Louis comes the announcement that a 10,000-ton order was placed there.

## Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, }  
CHICAGO, April 25, 1894. }

General business is still halting. A few branches show some improvement, but they are in marked contrast to the dullness prevailing in other lines. Considerable apprehension prevails regarding the possible effect of the Coal miners' strike which now prevails throughout the greater portion of the central West. While the strike is not universal, it is nevertheless of such huge proportions that it bids fair to paralyze trade if it continues for any considerable length of time.

**Pig Iron.**—The trade in local Coke Irons has latterly been confined to car-load orders almost entirely, but they have been fairly numerous. Advices received from the Southern furnace companies state that they are very much disturbed over the strike among the Coal miners. The Alabama furnaces are more affected than the Tennessee. Agents are notified to be careful in making contracts for future delivery, as the manufacturers may not be in a position to fill them. Consumers, however, are not buying much at present, so that the strike in the South will hardly cause much annoyance in this section. Prices thus far have not been affected. The greater part of the trade now occurring is with country customers, as the city foundry trade has been decidedly curtailed by the local building troubles. Lake Superior Charcoal continues very quiet. Quotations are given as follows for cash:

|                                 |           |         |
|---------------------------------|-----------|---------|
| Lake Superior Charcoal.....     | \$15.00 @ | \$15.50 |
| Local Coke Foundry, No. 1....   | 11.25 @   | 11.50   |
| Local Coke Foundry, No. 2....   | 10.50 @   | 11.00   |
| Local Coke Foundry, No. 3....   | 10.00 @   | 10.50   |
| Local Scotch.....               | 11.50 @   | 11.75   |
| Ohio Strong Softeners No. 1.... | 12.50 @   | 13.50   |
| Southern Silvery, No. 1.....    | ..... @   | 11.50   |
| Southern Silvery, No. 2.....    | ..... @   | 11.00   |
| Southern Coke, No. 1.....       | 10.00 @   | 10.35   |
| Southern Coke, No. 2.....       | 9.75 @    | 10.00   |
| Southern, No. 1, Soft.....      | 10.25 @   | 10.50   |
| Southern, No. 2, Soft.....      | 9.75 @    | 10.00   |
| Tennessee Charcoal, No. 1....   | 15.00 @   | 15.50   |
| Tennessee Charcoal, No. 2....   | 14.50 @   | 15.00   |
| Alabama Car Wheel.....          | 17.50 @   | 18.00   |
| Jackson County Silvery.....     | 15.00 @   | 16.00   |
| Other Ohio Silvery.....         | 12.50 @   | 13.00   |
| Coke Bessemer.....              | 12.00 @   | .....   |

**Bars.**—Bar Iron has taken another dip downward and mill shipments can now be quoted at 1¢ @ 1.10¢, Chicago delivery. The reduction in price is not stimulating consumption and orders during the week have been small and far apart. Inquiries are light, so that but little business is in sight. Manufacturers are of the opinion that the annual midsummer suspension of work will occur much earlier than usual this year. It would not be surprising to hear at any early day of the closing of a considerable number of rolling mills, partly because of a lack of orders and partly because prices are too low to enable the makers to get out whole. Consumers are now discriminating against so-called Soft Steel Bars of Scrap Steel, which prove very unsatisfactory in any work requiring forging or machine work. They are insisting on Bars made from Billet stock, and our quotations are therefore made for the better class of material. Manufacturers quote for such Bars 1.20¢ @ 1.25¢, Chicago, for mill shipments. Jobbers have had a somewhat better trade the past week, but it is of a spasmodic character and they are hardly encouraged sufficiently to report an improvement in business. They quote small lots of Bar Iron from stock at 1.20¢ upward and Soft Steel Bars at 1.30¢ upward, according to quantity.

**Structural Material.**—The city demand continues very small, as building troubles are not yet ended. The trade with outside localities keeps up well, and some of the city yards are very busy in getting out country orders, which, though small, are so numerous as to aggregate an excellent volume of business. Prices on Beams have now reacted slightly and are not quoted at the very low rates recently prevalent. Quotations on mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.35¢ @ 1.40¢; Tees, 1.50¢ @ 1.60¢; Angles, 1.30¢ @ 1.40¢; Universal Plates, 1.30¢ @ 1.35¢. Small lots of Beams from stock are selling at 1.50¢ @ 1.60¢ @ 100 lb.

**Plates.**—A change has come over the Plate market which may or may not be significant. Several of the most important concerns have withdrawn from the market or else advanced their prices, which has the same effect. Dealers are experiencing no improvement in the demand for small lots from stock. Mill shipments, Chicago delivery, may be quoted as follows: Tank Steel, 1.35¢ @ 1.40¢; Flange Steel, 1.60¢ @ 2.10¢; Fire Box, 2¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.80¢ @ 1.90¢; Tank Steel, 1.60¢ @ 1.85¢; Flange Steel, 2.10¢ @ 2.35¢; Boiler Tubes, 75¢ off.

**Sheets.**—Trade in Black Sheets continues good and prices are not perhaps quite so low as they have been. Manufacturers of best brands have refused to meet the quotations on inferior grades and are at last entering contracts at their own figures. Good quality No. 27 Common Iron is selling at 2.35¢ @ 2.40¢ for mill shipment, Chicago delivery. Small lots are quoted at 2.70¢. Galvanized Iron is in fairly good demand, with manufacturers quoting mill shipments at 77½ and 80 % off, Chicago delivery. Small lots from stock are selling at 75 and 10 % to 77½ %, according to quantity. Sheet Copper continues to be held at 14¢ base, with no discount.

**Merchant Steel.**—Business in this line has latterly been quiet. We quote mill shipments, Chicago delivery: Smooth Finished Machinery and Tire, 1.70¢ @ 1.80¢; Open Hearth Spring Steel, 1.85¢ @ 1.90¢; Bessemer Machinery, 1.55¢ @ 1.60¢; Bessemer Tire, 1.40¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

**Billets and Rods.**—Inquiries are reported for upward of 6000 tons of Steel Billets, but for deliveries which the local manufacturers were unable to make. They quote on future business nominally \$17 @ \$17.25. Prospects are improving for contracts for Wire Rods for future delivery, and prices are firmly held at \$26.50.

**Rails and Track Supplies.**—A much better inquiry for Steel Rails has developed of late, and some very good projects are taking shape which will require considerable quantities. The local mills are now assured a steady run until well into the fall, contracts already booked covering the next three months, running at a moderate rate. Quotations are \$25 @ \$27 for standard sections of Steel Rails; 1.25¢ @ 1.40¢ for Splice Bars; 2.30¢ for Track Bolts with Hexagon Nuts, and 1.70¢ @ 1.80¢ for Spikes.

**Old Rails and Wheels.**—In the absence of transactions in Old Iron Rails quotations are nominally \$10 @ \$10.50. Long lengths of Old Steel Rails are quoted \$9.50 @ \$10, and a sale is re-

ported of Frogs and Guards at \$6.60. Old Car Wheels are stagnant, with quotations nominally \$10 @ \$10.50.

**Scrap.**—The demand for Old Material seems to get lighter with the progress of the season. The local mills are buying very little, as some of them anticipate an early stoppage of operations. Dealers quote the following prices  $\text{\$}$  net ton: Forge Scrap at  $\text{\$}$  8 @  $\text{\$}$  8.50; selected Heavy Cast at  $\text{\$}$  8 and selected Mill at  $\text{\$}$  7. These prices vary somewhat from quotations made by dealers in a regular way. They quote the following selling prices  $\text{\$}$  net ton: Railroad Forge,  $\text{\$}$  9; Dealers' Forge,  $\text{\$}$  8 @  $\text{\$}$  8.50; No. 1 Mill,  $\text{\$}$  6.50; Pipes and Flues,  $\text{\$}$  6; Heavy Cast,  $\text{\$}$  7 @  $\text{\$}$  7.50; Stove Plate,  $\text{\$}$  5 @  $\text{\$}$  5.50; Fish Plates,  $\text{\$}$  10; Horseshoes,  $\text{\$}$  9; Mixed Steel, gross ton,  $\text{\$}$  5.

**Metals.**—Carload lots of Lake Copper are unchanged at 10¢. Casting Copper is quoted at 9½¢, but the market is by no means firm. Spelter is weak at 3.30¢ @ 3.35¢. Prices are now considered so low that dealers are advising their customers to lay in stocks. Pig Lead has been quite dull since our last report, and carload lots are quoted at 3.25¢ @ 3.30¢.

John McLauchlan, manager of the Western office of the Andrews Brothers Company, has removed from 59 Dearborn street to the New York Life Building, corner Monroe and La Salle streets, Chicago. The Andrews Brothers Company are manufacturers of Bars, Bands, Hoops and Sheets of Iron or Steel and Haselton Scotch Pig Iron.

Backman, Forsyth & Co., Pig Iron and Coke commission merchants, have removed from The Rookery to room 910 Medinah Temple, corner of Jackson street and Fifth avenue, Chicago.

The Manufacturers & Merchants' Warehouse Company, 10 to 24 West Water street, have been appointed sales agents for the New Philadelphia (Ohio) Iron & Steel Company, manufacturers of Black, Cold Rolled, Pickled and Galvanized Sheets, and will represent this company in Chicago and the West.

## Louisville.

LOUISVILLE, KY., April 23, 1894.

There continues to be a fair amount of selling, but prices have not improved. The largest sale was between 2000 and 3000 tons. Prices were made for long deliveries as low as \$6.75, Birmingham, for No. 2 Foundry, and other grades in proportion. Buyers appreciate the extreme low offerings, in that they are trying to purchase for fall delivery upon this basis. Whether furnaces will decide that it is wise to sell so far ahead has not yet been determined. Among Pipe shops there is a large number of orders for finished product being placed, but no change in prices, sales being effected on a basis in which every concession is made in favor of the buyer, leaving no profit to the producer. Among car companies they report scarcely any work in sight, even at present prices. We quote for cash, f.o.b. cars Louisville, Ky.:

|                                   |           |         |
|-----------------------------------|-----------|---------|
| Southern Coke, No. 1 Foundry.     | \$10.25 @ | \$10.50 |
| Southern Coke, No. 2 Foundry.     | 8.75 @    | 9.25    |
| Southern Coke, No. 3 Foundry.     | 8.50 @    | 8.75    |
| Southern Coke, Gray Forge.        | 8.00 @    | 8.50    |
| Southern Charcoal, No. 1 Foundry. | 12.50 @   | 13.50   |
| Southern Car Wheel.               | 15.00 @   | 15.50   |

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., April 24, 1894.

The market appears to have an improving tendency, and while prices are about the same it is easier to do business than it has been for a long time past. Consumers' requirements are widening, and in many cases deliveries are called for with the utmost urgency, showing that stocks are low, and that whatever demand there is must be supplied from new purchases. The amount of business done during the past two weeks is larger than for any similar period since last summer, and while there may be somewhat of a pause during the remainder of the month, there is good reason for believing that the improvement is genuine and likely to be maintained for some time to come. Prices are not quotably dearer, but sales average better, which with the larger turn over are strong points in favor of the manufacturer. Mills are doing more work almost without exception, some in certain departments are pushed to their utmost capacity, but averaging it all around there is easily two-thirds employment, which is much better than could have been said at any time within the previous six months. At Marshall Bros. & Co.'s mills the demand for Sheets for tinning purposes is crowding them to the utmost, and at Wilmington, Del., and North East, Md., the McDaniel & Harvey Co.'s mills are running full on their specialties. Similar reports come from the Structural mills and from some of the Plate mills, but less favorable reports are met with in regard to the Bar trade, although a few of the mills are doing fairly, but at extremely low prices. On the whole, however, the week has developed a fair degree of improvement, and as reports from the West are also of a very favorable character, the outlook for the near future is regarded with a good deal of confidence.

**Pig Iron.**—The demand has been very satisfactory, and while prices are in some cases at the lowest and in others only a trifle above that, there is nevertheless a better feeling, because at a price holders begin to feel sure that they can find a market. The heaviest end of the business has been in Bessemer, at prices equal to \$11.65 @ \$11.75. Philadelphia, and in Pipe Iron at \$10.50 @ \$10.75. This is a slight advance on the last mentioned grade, and 10¢ to 15¢ more is asked for Bessemer, but after the recent heavy purchases it is not certain that buyers will follow the advance, as their immediate wants are pretty well covered. In standard Foundry Irons there is a steady run of orders, and furnaces are in better shape than they have been for some time. There is a little irregularity in prices, due to the difference in freights to certain points, but on the whole the situation shows improvement, mainly in the better demand, which, however, is a necessary preliminary to better prices. General quotations for Philadelphia or equivalent points are about as follows:

|                           |           |         |
|---------------------------|-----------|---------|
| Bessemer.                 | \$11.65 @ | \$11.85 |
| Standard No. 1 Foundry X. | 12.50 @   | 11.85   |
| Standard No. 2 Foundry X. | 11.75 @   | 12.25   |
| No. 2 Plain.              | 10.75 @   | 11.00   |
| No. 1 Soft.               | 11.50 @   | 12.00   |
| No. 2 Soft.               | 10.75 @   | 11.00   |
| Standard Gray Forge.      | 10.75 @   | 11.00   |
| Ordinary.                 | 10.50 @   | 10.75   |

**Steel Billets.**—There is an irregularity in quotations which is somewhat puzzling in view of the firmer quotations on Pig metal. Sellers quote \$17.25,

Philadelphia, or its equivalent, but buyers intimate that they can get in at \$17 on 1000-ton lots, and in special cases this is probably true, although some makers decline to meet even \$17.25. A good deal depends on the size and character of order, however, as well as on the amount of business that the mill has in hand. At present the feeling is not favorable to anything at much over \$17 @ \$17.25, but if higher figures continue to be realized for Pig metal, the product must necessarily be adjusted in proportion.

**Finished Material.**—Reports from this department are generally of a favorable character, although there is no new work of special importance. Small work is very abundant, however, and from this class of consumers there is a steady day to day demand at somewhat better prices than those hitherto ruling. Mills report about two-thirds of their capacity in operation, which averages better than at any time for several weeks past, and from general indications it is probable that this or better will be maintained during the next two or three months. There is a good deal of irregularity in prices, however, and while the tendency is toward improvement, weak spots are occasionally met with, and offers from the West are heard of at extraordinarily low prices, particularly for Bars. General quotations are about as follows:

|                           |         |       |
|---------------------------|---------|-------|
| Grooved Skelp, delivered. | 1.15¢ @ | 1.25¢ |
| Standard Refined Bars     | 1.30¢ @ | 1.40¢ |
| Medium quality.           | 1.15¢ @ | 1.20¢ |
| Tank Steel.               | 1.20¢ @ | 1.30¢ |
| Heavy Plates.             | 1.30¢ @ | 1.40¢ |
| Shell.                    | 1.40¢ @ | 1.50¢ |
| Flange.                   | 1.60¢ @ | 1.80¢ |
| Angles.                   | 1.20¢ @ | 1.30¢ |
| Beams and Channels.       | 1.40¢ @ | 1.60¢ |

**Old Material.**—There is a better business all around, but prices show no improvement and are in fact barely maintained except for choice lots. General asking prices are about as follows, delivered:

|                      |           |         |
|----------------------|-----------|---------|
| Heavy Melting Steel. | \$10.00 @ | \$11.00 |
| Light Melting Steel. | 8.00 @    | 9.00    |
| No. 1 Wrought Scrap. | 10.00 @   | 11.00   |
| Machinery Cast.      | 9.50 @    | 10.00   |
| Wrought Turnings.    | 8.00 @    | 8.50    |
| Cast Borings.        | 6.00 @    | 6.50    |
| Old Iron Rails.      | 12.00 @   | 12.50   |

## Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, April 24, 1894.

The strike of the Coal miners on Saturday, the 21st inst., with every probability of a general strike in the Coke regions within the next day or two, has brought about a very unsettled condition of affairs, and the future is very uncertain. Should the Coal strike be prolonged, as it promises to be, it will soon result in the closing down of the finishing mills, as few concerns have sufficient fuel to last more than a few days. On the other hand, should the Coke workers go out again, and reliable advices indicate that they will, a general suspension of operations among the blast furnaces will take place. It will likely be known in a day or two what proportions the threatened Coke strike will assume.

**Pig Iron.**—The large purchase of Bessemer by Eastern mills and also by speculators referred to last week, together with the heavy consumption by Pittsburgh and Wheeling mills, has pretty thoroughly cleaned up stocks, and Bessemer for prompt shipment is scarce and higher. The probability of a general Coke strike is also having its effect, and unless all signs fail further

advances in the market will take place. The largest Pig Iron maker in this district was credited with having 60,000 tons of Coke at the beginning of the former trouble, but this amount has been materially reduced during the last few weeks. As this concern are making close to 90,000 tons of Iron per month, it will be seen at once that they are comparatively little better off than their competitors. If the Coke strike is inaugurated it promises to be general throughout the region, as the demands of the men are for 90¢ @ 100 bushels, as against 78¢ paid under the Frick scale. The situation to day is considerably more threatening than it was when the former strike was started. There are a number of inquiries in the market for Bessemer for early delivery, but there is considerable difficulty in finding furnaces that can promise prompt shipments. Gray Forge and Foundry are in very light demand, the foundries, as a rule, not being employed to more than half capacity. In our report last week the sale of Bessemer at \$9.75 at Valley furnace was equal to \$11.45 at Harrisburg, instead of \$11.25, as was stated. We have advanced quotations on Bessemer Pig and quote as follows:

|                         |          |               |
|-------------------------|----------|---------------|
| Neutral Gray Forge..... | \$9.25 @ | \$9.40, cash. |
| All-Ore Mill.....       | 9.35 @   | 9.50 "        |
| No. 1 Foundry.....      | 11.00 @  | 11.25 "       |
| No. 2 Foundry.....      | 10.25 @  | 10.50 "       |
| No. 3 Foundry.....      | 9.75 @   | 10.00 "       |
| Bessemer.....           | 10.50 @  | 10.75 "       |

We note a sale of 5000 tons of Bessemer for April, May and June at \$10.50 Pittsburgh, and also one of 2000 tons at same deliveries and terms. Also a sale of 50 tons of No. 2 Foundry at a price equal to \$10.25 Pittsburgh.

**Ferromanganese.**—This market is entirely controlled by the local concerns, and the price of \$53, delivered, for 80 % domestic, is maintained.

**Billets.**—The market is in practically the same condition as noted last week. Makers both here and at Wheeling are well fixed and are quoting \$16 at mill, one local mill having set their price at \$16.25 at mill. Buyers are holding off, not being willing to pay the advance, which amounts to from 50¢ to 75¢ @ ton. A mill in the Wheeling district will probably make some extensive improvements in the near future. The substitution of soaking pits for heating furnaces and the erection of an additional blast furnace are contemplated.

**Structural Material.**—A Western contract calling for close to 1000 tons that should have been placed some time ago has been unexpectedly held back by legal difficulties. Several fair sized orders for bridge material have recently been placed. Prices on Beams are showing a firmer tendency, 1.15¢ at mill being rock bottom for desirable orders and 1.25¢ for ordinary business. We quote as follows: Beams and Channels up to 15 inches, 1.20¢ @ 1.25¢; Angles and Universal Plates, 1.10¢ @ 1.20¢; Tees, 1.25¢ @ 1.35¢.

**Plates.**—The situation is without material change. The mills have a fair amount of work, but new business coming in is confined principally to small lots. We quote as follows: Tank Steel, 1.10¢ @ 1.20¢; Flange, 1.50¢ @ 1.60¢; Shell, 1.30¢ @ 1.40¢; Fire Box Steel, 1.75¢ @ 4¢, according to quality.

**Sheets.**—The large buyers are placing their orders and considerable tonnage was booked last week. The mills continue to refuse to quote for deliveries beyond July 1 next, in the expectation that labor troubles will take place.

We quote as follows: No. 24, 2.15¢; No. 26, 2.25¢, and No. 27, 2.35¢, at mill.

**Bars.**—The volume of business is small and there does not seem to be any indication of early betterment in this respect. Prices are being fairly well maintained and are without material change. We quote Common Iron Bars at 1¢ @ 1.10¢ at mill, half extras; Soft Steel Bars, 1.10¢ @ 1.20¢, with Bar Iron extras.

**Merchant Steel.**—Business is reported slightly better in the matter of inquiries. A local mill received an inquiry last week for a considerable amount of Steel for shipment to Canada. We have reduced quotation slightly on Open Hearth Machinery and quote as follows: Bessemer Machinery, 1.30¢ @ 1.35¢; Open Hearth Machinery, 1.50¢ @ 1.60¢; Open Hearth Spring, 1.70¢ @ 1.75¢; Toe Calk, 1.80¢ @ 1.85¢; Machine Straightened Tire, standard quality, 1.60¢ @ 1.65¢; Cold Drawn Steel Shafting, 2.57½¢ base; Tool Steel, 5¢ @ 7¢ for ordinary grades.

**Muck Bars.**—We quote nominally at \$19 for best grades delivered at buyers' mill. We are not advised of any sales.

**Skelp Iron and Steel.**—There is a fair demand with prices ruling as follows: Grooved Steel Skelp, 1¢ @ 1.10¢, according to size and order; Sheared Steel Skelp, 1.10¢ @ 1.20¢; Grooved Iron Skelp, 1.15¢ @ 1.25¢; Sheared Iron Skelp, 1.25¢ @ 1.35¢.

**Pipes and Tubes.**—Last week the Central Contract and Finance Company of Lafayette, Ind., placed an order for some 85 miles or more of Line Pipe, the order being divided among three concerns. The 8-inch and 10-inch Pipe, of which there were some 50 or 55 miles, together with about 25,000 feet of 5½-inch Casing, went to an Eastern mill. The 3 inch and 4-inch Pipe, amounting to about 25 miles, went to Pittsburgh, while about 10 miles of 2-inch Pipe was taken by an Indianapolis concern, but will be made in Pittsburgh. The Manufacturers' Natural Gas Company of Indianapolis, Ind., will probably let a contract this week for 4 miles of 8-inch Pipe and several miles of 6-inch. Several other fair sized contracts are in sight and are expected to be let at an early date.

**Wire Rods.**—Offers to sell Rods for May and June delivery on the basis of \$23.50, at mill, or about \$24. Pittsburgh, have recently been made. No sales are reported, buyers apparently having their wants covered for some time to come.

**Barb Wire.**—There is a good volume of business in Barb Wire, and makers are pushed to get material as fast as customers want it. In spite of this condition, prices are weak and lower. We quote Four Point Galvanized at \$2.10, Pittsburgh, and for a desirable order this price would probably be slightly shaded. We quote Painted at \$1.75 @ \$1.80, and Plain at \$1.35, in carload lots.

**Wire and Cut Nails.**—The demand is falling off to some extent, but on account of large orders booked some time ago, manufacturers are well occupied. We quote Wire Nails at 95¢ at mill in carload lots. Cut Nails are in only moderate demand, and we quote at 90¢ at mill for the usual averages. For desirable specifications this price is shaded slightly.

**Connellsville Coke.**—As noted elsewhere, the situation in the Connellsville

region is threatening, and indications point to a general strike. Reports received to day state that at two prominent works the men have ceased work voluntarily, but absolutely refused to go on strike two weeks ago. It is claimed the agitators in the region have successfully worked on the feelings of the men, and that a general sentiment prevails to cease work. Important developments are expected on Wednesday or Thursday. Furnace Coke continues to rule at 85¢ @ 90¢, and Foundry Coke at \$1 @ \$1.10 to consumers.

(By Telegraph.)

The situation in the Connellsville region to-day shows that the strikers are making good headway and the number of idle ovens is rapidly increasing. All the ovens of Brown & Cochran are now idle. It is not improbable that every oven in the Connellsville region will be idle before this week is out unless the demands of the men are granted. The Atlas Coke Company have signed the scale demanded by the strikers. It provides for 90¢ @ 100 bushels for mining, 53¢ @ 100 bushels for drawing Coke, and 12½ % increase in other wages. This firm operate about 150 ovens, the greater part of their output being taken by the Salem Iron Company, operating a blast furnace at Leetonia, Ohio. The balance of their product is sold in the open market as Foundry Coke.

## St. Louis.

(By Telegraph.)

Office of The Iron Age,  
Bank of Commerce Building,  
St. Louis, April 25, 1894.

**Pig Iron.**—The strike of the Coal miners in Alabama is the only feature of the market at this writing. Orders are taken subject to furnace acceptance, and will continue so until the matter is settled. It is doubtful if the strike will have any effect on prices, as the stock of Iron on the furnace banks is sufficient to meet the wants of the trade for some little time. The demand is only fair and runs largely to carload orders. Prices are perhaps a trifle weaker but not quotably lower. We quote as follows for cash, f.o.b. St. Louis:

|                                   |           |         |
|-----------------------------------|-----------|---------|
| Southern Coke, No. 1 Foundry..... | \$10.75 @ | \$11.00 |
| Southern Coke, No. 2 Foundry..... | 9.75 @    | 10.00   |
| Southern Coke, No. 3 Foundry..... | 9.50 @    | 9.75    |
| Southern Gray Forge.....          | 9.25 @    | 9.50    |
| Southern Car Wheel.....           | 16.75 @   | 17.75   |
| Lake Superior Car Wheel..         | 16.25 @   | 16.50   |
| Ohio Softeners.....               | 14.25 @   | 14.50   |

**Bar Iron.**—The demand for Bar Iron does not show any improvement whatever. Car builders are doing nothing and do not look for any improvement in their business. Jobbers are buying only as their stocks need replenishing. Prices are weak, and a good round order with fair specifications would be taken at low price. Mills quote 1¢ @ 1.05¢. Jobbers report a dull trade at 1.25¢ @ 1.30¢.

**Barb Wire.**—There seems to be a falling off in the demand for Barb Wire and prices are not as strong as last reported. Painted is quoted at \$1.80 @ \$1.85 and galvanized at 40¢ @ hundred-weight additional.



**Wire Nails.**—There is no improvement to note in this market. Nails are being offered at low prices, and it is difficult to quote the market accurately. Local mills ask \$1.10 for carload lots, but this price has been shaded in many instances. The future of Wire Nails is not very bright and lower prices seem inevitable.

**Rails and Track Supplies.**—A sale of 10,000 tons of Standard Rails was closed here last week. The Rails are for a Southern road. Track Supplies are dull, and are quoted as follows: Splice Bars, 1.30¢ @ 1.35¢; Spikes, 1.70¢ @ 1.75¢; Bolts, Square Nuts, 2¢ @ 2.05¢; with Hexagon Nuts, 2.10¢ @ 2.15¢; Steel Links and Pins, 1.60¢ @ 1.65¢; Iron, 1.75¢; Old Iron Rails are nominally quoted at \$10; Steel Rails, \$26 @ \$27.

**Pig Lead.**—The movement in this metal is restricted to carload lots, which command 3.22½¢. Offers of 3.20¢ do not find any sellers, and a higher range of prices seems assured.

**Spelter.**—The market is steady at 3.30¢. Sales are limited, and at the price above mentioned the market seems to have rested. Furnaces are closing down, and the producing capacity of the country is easily reduced 50%. A slight improvement in the demand will result in higher prices.

Robidoux & Corby, manufacturers' agents, have moved their offices from the Commercial Building to the new Security Building, where they have better and more commodious offices.

## Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts.,  
CINCINNATI, April 25, 1894.

There has been practically no business in Pig Iron during the week ending to-day, for the furnaces were not disposed to take orders for fear they might not be able to obtain Coal for an indefinite time, although they do not look for a prolonged contest. On the other hand, consumers of Iron do not require immediate supplies and are getting enough on contracts for their current necessities. There is no quotable change in leading qualities of Southern Iron, but there is scarcely enough trading to warrant quotations. There is nothing of consequence doing in Charcoal Iron. The orders from the East have fallen off and all parties in the trade are waiting to see what the future may develop. A possible advance in prices of Pig Iron would doubtless be welcomed even by consumers, as it is thought that the trades would thereby be benefited, for the low rates which have prevailed have proved to be unsatisfactory in most instances. Quotations are merely nominal, as follows:

### Foundry.

|                                 |                   |
|---------------------------------|-------------------|
| Southern Coke, No. 1.....       | \$10.25 @ \$10.10 |
| Southern Coke, No. 2.....       | 9.25 @ 9.50       |
| Southern Coke, No. 3.....       | 8.75 @ 9.00       |
| Ohio Soft Stone Coal, No. 1.... | 14.50 @ 15.50     |
| Ohio Soft Stone Coal, No. 2.... | 14.00 @ 14.50     |
| Lake Superior Coke, No. 1.....  | 12.50 @ 13.00     |
| Lake Superior Coke, No. 2.....  | 11.50 @ 12.00     |
| Hanging Rock Charcoal, No. 1..  | 17.00 @ 17.50     |
| Hanging Rock Charcoal, No. 2..  | 16.50 @ 17.00     |
| Tennessee Charcoal, No. 1.....  | 13.00 @ 13.50     |
| Tennessee Charcoal, No. 2.....  | 12.00 @ 12.50     |

### Car Wheel and Malleable Irons.

|  |               |
|--|---------------|
| Standard Southern Car Wheel                | 16.25 @ 17.00 |
| Lake Superior Car Wheel and Malleable..... | 16.25 @ 16.75 |

### Forge.

|                    |             |
|--------------------|-------------|
| Gray Forge .....   | 8.50 @ 8.75 |
| Mottled Coke ..... | 8.25 @ 8.50 |

## Metal Market.

**Copper.**—The strike on the Great Northern Railroad has seriously interfered with mining and smelting operations in Montana. That interference, in turn, has caused some operators to purchase supplies in other quarters to fill outstanding contracts. In one instance about 300,000 lb Electrolytic were taken at 9½¢ for such purpose, and it is understood that other purchases have been made. Apart from this the market is bare of new feature, only routine business being under way in Lake Superior Ingot or Casting Copper. Prices have varied in a slight degree only from 9½¢ and 9¢ @ 9½¢ for the respective varieties. Exports from this port during the past week include 611 tons bars, 334 tons pigs, 150 tons ingots, 188 tons plates and 20 tons cakes. Baltimore exports were 75 tons ingots, 111 tons cakes and 10 tons bars.

**Pig Tin.**—Prices have averaged somewhat below the highest point reached last week. On prompt deliveries 19 50¢ net cash for 5 ton lots was touched. May and later deliveries could have been secured at 0.5¢ @ 0.10¢ discount. From the extreme lowest figures a slight reaction took place toward the close. carload lots having been sold at 19.60¢ net cash during the past few days. There has been very little speculative business and not more than fair average buying for interior account or for consumption. Fresh supplies continue to be quite in line with the consumption, and London fluctuations still govern the movements of prices in this market to a great extent, since there are no really important local influences. At the close the market seemed quite stiff, with prices on the basis of 19.60¢ @ 19.65¢ net cash for Straits, prompt delivery.

**Pig Lead.**—Business here has been unimportant and involved only a few hundred tons all told. The transactions were mostly at 3.45¢ @ 3.47½¢, with single carloads at the last named price. There is no change in the general situation save that buyers in this vicinity are more reserved and not bidding 3.45¢ as freely as they did a week ago. Speculative interest is still extremely tame.

**Spelter.**—Sharp competition, in which two of the largest Western producers figured most prominently, has somewhat demoralized the market, and at present values are very uncertain. Sales have been made of common Western at 3.50¢ delivered here, prompt shipment, and some lots were purchased at 3.25¢ in St. Louis for Eastern account. In the face of this bids were made on 'Change of 3.52½¢ @ 3.57½¢ for July and later deliveries. Latterly there has been more or less curtailment of production, equivalent, it is estimated, to 25,000 tons per year. This was due mostly to loss in selling at late prices.

**Antimony.**—Merely routine business has passed, but enough of it to keep prices quite steady at 8½¢ @ 8½¢ for Hallett's, and 10¢ @ 10½¢ for Cookson's.

**Nickel.**—The popular price for round lots is 40¢. Small parcels bring 3¢ @ 5¢ more. Only routine demand is experienced here.

**Tin Plates.**—Business has been exceedingly slow. Orders for spot goods have fallen below the average, and in numerous instances sellers have shaded the prices generally quoted to the extent of 5¢ per box on orders involving only a few hundred boxes. Forward

shipments, although offered at somewhat lower prices, have met with very limited sale. For stock on the spot we quote as follows: Coke Tins—Penlan grade IC, 14 x 20, \$5.10; J. B. grade, full weight, \$5.15; light weights, \$4.75 for 100 lb, \$4.65 for 95 lb, \$4.60 for 90 lb; Bessemer full weight, \$5.15; light weights, \$4.70 @ \$4.75 for 100 lb, \$4.65 for 95 lb, \$4.55 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.40; Siemens Steel, IC basis, \$5.50; IX basis, \$6.60. Charcoals—Molyn grade, IC, \$6.25; Crosses, \$7.75; Alloway grade, IC, \$5.40; Crosses, \$6.50; Grange grade, IC, \$5.50; Crosses, \$6.60. Charcoal Ternes—Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11.25; M. F., 14 x 20, \$7.20; do., 20 x 28, \$14.50; D. R. D. grade, 14 x 20, \$5; do., 20 x 28, \$9.75; Alyn grade, 14 x 20, \$5.20; do., 20 x 28, \$10.25 @ \$10.40. Wasters—S. T. P. grade, 14 x 20, \$4.60; do., 20 x 28, \$9; Abercarne grade, 14 x 20, \$4.50; do., 20 x 28, scarce.

## Financial.

A significant proof of underlying strength and confidence in the financial situation is found in the fact that the market for securities has, during the past week, maintained its equilibrium in the face of many discouraging factors. The continued delay in the Senate over the tariff bill, the general dullness of trade, the serious strikes of workmen in various parts of the country, the labor unrest which has resulted in such extraordinary movements as those of Coxey and his imitators, the continued reports of decreased railroad earnings, the export shipments of gold, would singly in ordinary times have served to affect the stock market unfavorably. But, as a matter of fact, all of these circumstances combined and active "bear" efforts into the bargain have not sufficed during the past week to depress values to any appreciable extent.

Speculation has in the main been narrow and confined largely to the "professional" traders; the outside public having apparently called a halt in their speculative and investment business in securities. Nevertheless, taking the entire list prices have been well maintained, and in some cases—notably in certain "industrials"—show an advance over those of last week. Some railroad stocks have declined a point or two from the closing figures of last week's report, particularly those roads on which strikes have occurred or are apprehended. Northern Pacific preferred stocks have dropped a point and a fraction. St. Paul, after a rise of two points late last week, on returns showing an increase in net earnings for March, has again dropped to the former level, following on less favorable returns for the first weeks of April. Atchison, Union Pacific, Burlington and Louisville have each dropped a shade. New York & New England has fallen a couple of points, in consequence of the announcement that the Reorganization Committee of that road proposed to assess the common stock \$20 a share. The committee's final plan will, it is expected, be published before the end of this week. Chicago Gas shares have been among the most active issues since the beginning of this week. They have been fluctuating feverishly for some weeks past as the prospects of a decision by the Attorney General of Illinois in the



matter of *quo warranto* proceedings were thought to be favorable or unfavorable to the company. The announcement on Tuesday afternoon that proceedings against the trust would be undertaken caused a sharp fall in the stock. Sugar, National Lead and National Cordage closed strong and active; and the market in general had a firmer tone on Wednesday. The following list shows the fluctuations of the more active stocks since the date of last report, with closing prices on Wednesday, April 25:

|                           | High-<br>est. | Low-<br>est. | Closing<br>Apr. 25. |
|---------------------------|---------------|--------------|---------------------|
| Am. Sugar Ref.....        | 99            | 95½          | 98½                 |
| Atchison, T. & S. Fé....  | 15¼           | 13¾          | 14½                 |
| Chicago Gas.....          | 69½           | 63           | 63½                 |
| Chic., B. & Q.....        | 81½           | 79½          | 80½                 |
| Chic., Mil. & St. Paul... | 63¼           | 61¾          | 62½                 |
| Gen. Electric.....        | 41            | 37¾          | 38¾                 |
| Louisville & Nashville... | 51¾           | 49½          | 50½                 |
| Missouri Pacific.....     | 30¾           | 29¼          | 30                  |
| National Cordage.....     | 23¼           | 21½          | 22¾                 |
| National Lead, Common.    | 40            | 36¾          | 38¼                 |
| New Jersey Central.....   | 113¼          | 110¾         | 111                 |
| New York Central.....     | 100¾          | 98¾          | 99½                 |
| N. Y. & New England...    | 10¾           | 8¾           | 9½                  |
| Northern Pacific, Pfd. .  | 20¾           | 18¾          | 19¾                 |
| Philadelphia & Reading..  | 20¾           | 18¾          | 20¾                 |
| Union Pacific.....        | 20¾           | 19¼          | 19¼                 |
| Wabash, Pfd.....          | 17¾           | 16¾          | 17                  |
| Western Union.....        | 84¼           | 83¾          | 84½                 |

Speculation in railway and miscellaneous bonds has for the time died away, but the market is good for choice bonds for investment. Prices for these latter are high and the supply below the demand. Outside the choice lines prices are weaker and business dull. Government bonds have remained firm and active. The transactions in 5's have been large during the week, and it is estimated that four-fifths of the bonds originally taken by the banks and trust companies have gone into the hands of investors. The insurance companies have been making some heavy purchases of Government bonds, and the inquiry from other sources is very active. For this reason it is believed that should a further issue of bonds be found necessary they would be readily absorbed. The closing quotations were as follows:

|                            | Bid. | Asked. |
|----------------------------|------|--------|
| 2's, 1891, registered..... | 96   | .....  |
| 4's, registered.....       | 113¾ | 114¾   |
| 4's, coupon.....           | 114  | 114¾   |
| 5's, registered.....       | 117¾ | 117¾   |
| 5's, coupon.....           | 118¾ | 119¾   |

The governors of the New York Stock Exchange on Monday adopted resolutions prohibiting so-called "arbitrage" business between the New York Exchange and exchanges in other cities, Boston and Philadelphia being particularly affected by the decision. The system was claimed to be inimical to the interests of the New York Exchange. The order has, nevertheless, created some considerable dissatisfaction among a section of the members.

Money in Wall street is more plentiful than ever. The drift of funds to this center continues so steadily that, despite the gold exports, the city banks gained in the aggregate last week over \$2,600,000 in cash. The volume of surplus over the legal reserve has grown to \$82,000,000. The difficulty of employing this plethora of money profitably is at the root of the recent gold exports, and for that reason the exports are not regarded with any apprehension. These exports amounted to \$3,000,000 from New York and \$500,000 from Boston by last Saturday's steamers, mainly to Paris, making about \$11,000,000 net exports of gold since January 1. Rates for exchange at the close do not show any profit in the export of specie, and it is not believed that any considerable amount more will go this week. The Treasury gold reserve is again down to

the \$100,000,000 mark, but Treasury officials are not apprehensive that it will fall to the level reached last fall before steps are taken for its reinforcement.

The loan market does not show any improvement. The supply of loanable funds is practically unlimited, while the demand does not expand to very notable extent, although there are indications that some interior banks are becoming desirous of obtaining credits from their New York correspondents. Call money is still nominally at 1%. Time loans for a whole year are reported to have been made on Government bonds at 1½%, and 2% on good stock collateral. Rates are quoted as 1½% for 90 days, 2% for four months and 2½% @ 3% for longer periods. Mercantile paper is dull, with a very limited supply of desirable material. Rates, 3% for best indorsed paper, 3½% @ 4% for high grade single names, and 4½% and upward for others.

Sterling exchange is firm, but the market is dull, with a meager supply of bills. Purchases against travelers' credits absorb all the bills offered. Actual business was done on Wednesday at \$4 87½ for 60 days, \$4.88½ @ \$4.88½ for demand, \$4.88½ @ \$4.89 for cables and \$4.86½ for commercial.

Exchange on New York at domestic centers is quoted as follows: New Orleans, commercial 100 premium, bank 150 premium; Charleston, buying par, selling ½ premium; San Francisco, sight 12½, telegraph 17½ premium; Savannah, buying par, selling ½ premium; Chicago, 35 @ 40 premium.

## New York.

Office of *The Iron Age*, 96-102 Reade street, }  
New York, April 25, 1894. }

**Pig Iron.**—The event of the week, so far as the local market is concerned, is the announcement that the rate on Pig Iron from Birmingham to New York, rail and water, has been reduced to \$3.50, a cut of 50¢ a ton. It is not surprising in the present condition of affairs that sellers are promptly giving away this reduction to buyers. The latest advices from Alabama are to the effect that the furnaces are all still running, and that a few miners are returning to work each day. There has been no change in miners' wages in Alabama for five years, and even among the miners themselves many recognize the necessity of some reduction. As yet sellers of Alabama Iron in this market do not seem to have received any positive instructions to withdraw. It is reported that Buffalo furnaces have swept the Canadian market, making large sales of that Iron, with some Southern brands for mixing with it. We quote standard brands \$12.50 @ \$13.25 for No. 1; \$11.25 @ \$12 for No. 2; \$10.50 @ \$11 for Gray Forge, at tidewater. Southern Iron, same delivery, \$11.50 @ \$12.25 for No. 1; \$10.50 @ \$11 for No. 2; \$10 @ \$10.25 for No. 3; \$10.25 @ \$10.75 for No. 2 Soft, and \$10.50 @ \$11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$9 75 @ \$10.25.

**Billets and Rods.**—The market is dull at \$17.50 @ \$18 for domestic, and nominally \$27 @ \$27.50 for foreign. Domestic Wire Rods are nominally \$26.50 @ \$27.50, and foreign \$39 @ \$40, tidewater.

**Steel Rails.**—Business in Standard Sections is very light. For Sections below the standard of 50 lbs. per yard some low prices are being made. Thus

Pittsburgh quoted \$22 50, delivered at a Maine point, for a lot of less than 1000 tons of 48's, netting a little less than \$19.25 at mill. On light Sections \$22 @ \$25, according to section, is being done at tidewater, while Girder Rails are reported to have sold down to \$20.50, at mill. In the aggregate, quite a considerable business is done in Rails fit to relay, taken from some of the trunk lines and some of the New England roads. The quotation for these is \$15 @ \$16. We may note in passing a sale of 5000 tons of English Rails for Canada. We understand that English Rails can be put down, c.i.f., Montreal, at \$19.

**Track Material.**—We quote as follows for small lots: Spikes, 1.55¢ @ 1.80¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 3¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.80¢, delivered.

**Manufactured Iron and Steel.**—The only large contract for Structural Iron placed in this market this week is for the Paterson Armory, involving 600 to 700 tons, taken by a local mill. An extension for a dry goods house has also been closed. Figures are in on a few large buildings, and quite a number of other large structures are in sight. Agents representing some of the Pittsburgh mills state that their works are full for some time to come, and they are asking about \$1 @ \$2 per ton advance. The sharp competition among a number of Eastern mills, however, keeps prices down, so that there is no quotable change. Bars and Plates are very quiet. A feature in the Hoop trade is the decline in the consumption due to the growth of the tank oil trade. Comparatively few barrels are being used for the export trade, which has cut down the Hoop requirements of the Standard Oil Company very materially. We quote: Beams up to 15-inch, 1.30¢ @ 1.50¢ for round lots; Angles, 1.20¢ @ 1.35¢; Universal Mill Plates, 1.15¢ @ 1.35¢; Tees, 1.40¢ @ 1.60¢; Channels, 1.30¢ @ 1.50¢, on dock. Steel Plates are 1.20¢ @ 1.30¢ for Tank; 1.35¢ @ 1.40¢ for Shell; 1.55¢ @ 1.60¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.20¢ @ 1.9¢, on dock, and Common 1.05¢ @ 1.20¢; Soft Steel Bars are 1.15¢ @ 1.30¢; Scrap Axles are quotable at 1.35¢ @ 1.50¢, delivered; Steel Axles, 1.35¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.40¢ @ 1.50¢, delivered; Cotton Ties, 65¢ @ 70¢ per 45-lb bundle, at mill; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.80¢ @ 1.90¢, and Sleigh Shoe, 1.60¢ @ 1.75¢, delivered.

**Old Material.**—A good deal of mystery surrounds the reports of sales of Old Steel and Old Iron Rails for shipment to Italy. It is asserted on the one hand that about 3000 tons of Old Steel Rails, long lengths, have been sold at \$9, delivered to vessel, while authorities for the trade doubt the accuracy of the statement, and question that any business whatever has been done thus far. There seems to be no doubt that the inquiry has been in the hands of responsible parties, but it is asserted that freights cannot be secured to allow the business being carried through. It is stated that there are some feelers out for the English market, upon which Russia has drawn quite heavily for Old Material for some time past. For the home trade there has been a sale of 1000 tons of Old Steel Rails at \$9, delivered. Old Iron Rails are offered at \$11.50 @ \$12, according to point of

delivery, while No. 1 Wrought Iron Scrap is readily obtainable at \$10. Old Car Wheels are \$9, delivered to buyer.

## British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]  
LONDON, WEDNESDAY, April 25, 1894.

Pig Tin prices declined early in the week, on very limited transactions, but subsequently recovered on purchases for American account and fair local speculative buying. Quite a large business was done in prompts, but the demand is rather small now. The market closed firm, with Straits at £70. 7/6 for prompt delivery, and £71. 2/6 for three months' futures.

Copper has been quiet. The market suffered somewhat from selling pressure by some speculative holders and the failure of a small dealer. Subsequent good buying at about £40. 1/3 for Merchant Bar prompts and lighter offerings by Americans brought about some improvement. Consumers' purchases have been limited, and they are moderate buyers now. At the close the market was steady. Merchant Bars quoted at £40. 2/6 @ £40. 5/ for prompts and £40. 12/6 @ £40. 15/ for three months' futures. Best selected English is at £43.

In the Tin Plate market depression is more severe after recent improvement. Sellers are yielding slightly to induce business, but make no quotable reduction in prices. Further concessions could not be made without positive loss. There is slightly more inquiry for Canada Plates, and some fair orders have been placed for Oil sizes. Liverpool quotations are as follows:

IC Charcoal, Alloway grade.....12/ @ 12/6  
IC Bessemer Steel, Coke finish. ....11/3 @ 11/6  
IC Siemens .....11/6 @ 11/9  
IC Coke, B. V. grade, 14 x 20.....Nominal.  
Charcoal Terne, Dean grade.....10/3 @ 10/6

Pig Lead has remained quite steady at £9. 2/6 for soft Spanish, with fair business.

Spelter is still quoted at £15. 12/6 @ £15. 15/ for ordinary Silesian, and the market remains quiet.

In the market for Iron and Steel no important changes have taken place. Last sales of warrants were at 42/8 @ 42/9 for Scotch, 35/10½ for Cleveland and 45/ for Hematite.

There is no doubt that negotiations have been pending for the sale of a lot of iron bars by a Birmingham, Ala., rolling mill for export to China. As yet they have not led to any business.

The break of the engine at the works of the Otis Steel Company, Cleveland, Ohio, will be repaired this week, when work will be resumed.

The fact that the farmers in several sections of the country through which the Coxey "army" has passed were vainly crying out for help, and were willing to give good pay for their labor, appears to be a decided refutation of

the theory that the so-called "Industrial army" is composed of genuine unemployed workmen. All accounts seem to point to the conclusion that the men are of the chronic idler class.

The Portage Iron Company, at Duncansville, Pa., will remodel one of their trains by putting in steel rolls and pinions so that they will be able to break down 4-inch billets on the hoop and cotton tie mill in the future.

The accountants appointed in connection with the wages sliding scale at the blast furnaces in the Middlesbrough district, England, have ascertained from the books of the makers that the average realized price of No. 3 Cleveland pig during the first quarter of the year was 34 shillings 11.83 pence (\$7.50) per ton, or 7.21 pence (14.6 cents) increase on the figure for the previous quarter, and the wages at the blast furnaces will be increased 0.75 per cent. for the current quarter.

The Peacemaker is the significant name given to the new and largest rifled gun ever made in the United States. It is intended for mounting in the battery of the battle ship "Indiana," now completing at Cramp's Yard at Philadelphia. The gun, whose mute pleading in its destined position should assuredly make for peace, is of 13-inch caliber, is 40 feet long and weighs 136,500 pounds. With a normal charge of 550 pounds of powder it can project a steel shell of 1100 pounds a distance of 14 miles. The weapon is breech-loading, and is worked entirely by hydraulic power in the matter of loading, training, cleaning, &c., the firing being done by electricity. At its recent test at Indian Head a muzzle velocity of 2100 feet per second was attained. Four of such guns are to constitute the primary batteries of the three battle ships "Indiana," "Oregon" and "Massachusetts."

The old suit of Armstrong *versus* Swift's Iron & Steel Works, which has been in the courts for a number of years, is again brought to public attention by the opinion just delivered at Newport, Ky., by Judge Crawford of the Circuit Court. Armstrong is receiver for the Fidelity National Bank of Cincinnati, whose cashier, Harper, wrecked it a few years ago. It was alleged by the Swift's Company that their treasurer, Matthews, conspired with Harper, who was also their president, to defraud the company by diverting to the bank large sums of money in order that Harper might use them in carrying through an extensive wheat deal in Chicago. The decision just rendered allows claims aggregating \$555,350 in favor of the Fidelity National Bank against the Swift's Iron & Steel Works.

According to the lately published census returns, the total valuation of property in the United States in 1890 was \$65,037,091,197, which was an increase of 49.02 per cent. over the returns of 1880, representing a per capita sum of \$1039. That the growth of the wealth of the country during the past five decennial periods has proceeded at a much higher ratio than the increase in population is shown by the following figures: In 1850 the total valuation of property in the country was a little over \$7,000,000,000, or \$308 per capita. In 1860 it was \$16,000,000,000, or \$514 per capita. In 1870 it was \$30,000,000,-

000, or \$780 per capita, and in 1880 it was \$43,500,000,000, or \$870 per capita. New York stands as by far the richest State, its wealth being estimated at \$8,-500,000,000. Pennsylvania comes second, with \$6,000,000,000, and Illinois third, with \$5,000,000,000.

The Bloomsburg Car Works of Bloomsburg, Pa., report business brisk at their works. Among recent shipments have been several box cars, gondolas and flat cars to Cuba and some dump cars to Ocala, Fla. Orders at present in course of fulfillment include a quantity of flat cars for La Compagnie de Chemin de Fer de Colonisation de Montfort, Montreal, Canada, and coal cars for shipment to Little Glace Bay, Cape Breton, N. S.

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# HARDWARE.

## Condition of Trade.

**T**HE VOLUME of business is not as large as last April, and during the month there has not been the increase which was anticipated by some. In view of the general practice of purchasing only such goods as are imperatively required for immediate sale or necessary replenishing of stocks, some merchants are supplying their wants from jobbers rather than from manufacturers to a greater extent than heretofore. At the same time an unusual number of orders for comparatively small quantities are received by manufacturers. In fact, jobbers, manufacturers and commission merchants refer to the number of orders which are received as comparing well with any previous season, while the quantity of goods handled is less than usual. The fact that prices are low has the effect also of still further diminishing the aggregate of business as expressed in dollars and cents. Business on the whole is doubtless in a more healthful condition than for some time, and all kinds of goods are going more evenly into the hands of the trade. Prices show no improvement and in many goods the market is weak. Quotations also from jobbers and manufacturers vary considerably, there being an evident desire on the part of all sellers to obtain such business as is to be had. There continues to be a good deal of cutting of prices on the part of jobbers, some of whom are sending out special quotations to induce orders from houses who have not been purchasing with what they consider sufficient liberality. In this condition of things the judicious purchase of Hardware requires careful attention and constant effort to keep posted as to the changes in price which are occurring. Collections give no ground for complaint.

### Chicago.

(By Telegraph.)

Shelf Hardware jobbers report their country trade fair, and even their city business is not as dull as had been anticipated when the building strike began. The past week, in fact, has seen a slight improvement. Orders are considerably more numerous than they were, but they are for small quantities

only, showing that merchants are still buying from hand to mouth. Seasonable goods are not active at present. The Refrigerator trade is slow and is not expected to show much improvement until the advent of warm weather. Manufacturers of Wire Cloth are again talking about a shortage. Jobbers are quoting \$1.45, and this price is held quite firmly in view of a probable short supply. The demand for poultry netting is large, and manufacturers are considerably behind in their deliveries on contracts. Jobbers' sales this year are practically double those of last year. This is now the height of the season for this branch of trade. Steel goods are quiet. Haying Tools are moving much more slowly than last year at this time, when the prospects for a heavy hay crop were so bright. Some improvement is noted in the demand for house furnishing goods, tinners' stock and tinware generally. Mail business is picking up in this line. Tin plate gives some indications of a stiffening in price. Spot lots of roofing plates and coke tin are very firm on account of the smallness of stocks. The American makers are overwhelmed with work and are running behind on deliveries, while stocks in importers' hands are lighter than ever before known. The demand for roofing tin is growing larger every week as the building season advances. The stocks of large architects have been completely exhausted, as importers will not keep any quantity of this on hand on account of Tariff uncertainties. Heavy Hardware is in a little better demand than last week, but trade is spasmodic, a day of big business being succeeded by two or three dull ones.

### St. Louis.

(By Telegraph.)

The Hardware business shows some improvement. This is especially true as regards the West and Southwest. The volume of trade, however, does not compare with April of last year, and as no one expected it to do so no disappointment is felt. Prices do not improve in any line of goods, in fact some lines are weaker, notably Wire Nails and Barb Wire. There is no speculative element in the market, most of the purchases being for immediate needs. There is a good trade in Road Scrapers, Hoes, Rakes, Lawn Mowers, Wagon Stock, Roofing Paper, Ice Cream Freezers, Wire Netting and Wire Cloth. Collections are excellent and will continue so just as long as dealers buy as they have been, from hand to mouth. It is overstocking which makes collections slow.

## Notes on Prices.

**Wire Nails.**—The demand for Wire Nails continues active and of the same general character that has prevailed for some weeks. Some large orders are being placed from time to time, but the great bulk of the business is in orders of moderate size. The mills are fully occupied, but are desirous of having their production for some weeks to come covered by orders in hand, and are consequently moving energetically for such business as is in sight. The change in the Canadian tariff seems to make it feasible to ship goods to that market, and Canadian merchants are making inquiries as to quotations, freight rates, &c. The price of Wire Nails remains as at our last report, 95 cents for carload lots at factory being a representative quotation, but attractive orders can command 90 cents, a price beyond which we do not hear of any sales. Small lots from store in New York are held at \$1.15 to \$1.25.

**Chicago by Telegraph.**—Manufacturers' agents report city trade extremely dull, but orders are coming in for fair quantities from country merchants. The consumption in the country generally appears to keep up very well. The demand is considerably below what manufacturers would like to see, and they are again making more vigorous efforts to sell. Prices are therefore still drooping, and are now down close to \$1 Chicago. Jobbers report a smaller demand from stock, and have lowered their prices for small lots to \$1.10 to \$1.15.

**Cut Nails.**—There is little change in the Cut Nail market. Prices are still affected to some extent by Western competition, and in parts of the Eastern territory which are accessible to the Western mills the manufacturers are meeting Western prices and departing to a certain extent from the policy which was adopted some time ago to quote only delivered prices in the several markets. The low freight rates which are prevailing are also favoring the Western mills, as they are at present able to place Nails at points which heretofore they have not been able to touch. The price of Nails delivered in New York is 95¢ to \$1 base, small lots from store in New York being regularly quoted at \$1.10 to \$1.15.

**Chicago by Telegraph.**—Manufacturers report a moderate trade, which is fully as large as they have reason to expect at this season. Factory prices are still quoted at 95¢ Chicago on 55¢ aver-

age. Jobbers quote small lots from stock at \$1.05 to \$1.10.

**Barb Wire.**—The demand for Barb Wire continues fair, but prices are uneven and the tone of the market not so strong as a few weeks ago. The market is represented by the following quotations for Four Point Galvanized, delivered at the points named: Pittsburgh, \$2.05 to \$2.15; Cleveland, \$2.10 to \$2.20; Cincinnati or Allentown, \$2.15 to \$2.25; Chicago or New York, \$2.25 to \$2.35, but it is probable that these quotations can be shaded.

**Chicago by Telegraph.**—Local manufacturers are still full of work, and in some cases are behind with their deliveries on contracts. Eastern manufacturers, however, seem to have caught up with their orders, as their representatives are soliciting trade in this market and promising prompt delivery. Quotations on factory lots of Galvanized Barb Wire are now about \$2.15, Chicago. Jobbers report a much better demand from stock than for Nails, and quote small lots of Galvanized at \$2.30 to \$2.40.

**Wire Cloth.**—On account of the depression which has for some time prevailed in all lines of business, less than the usual quantity of Wire Screen Cloth was manufactured for the present season. The demand for this article is now setting in actively on the jobbers, and the manufacturers are receiving supplementary orders from those whose purchases were made a few months ago, and the result is that their stock is becoming very short and promises soon to be exhausted. In this condition of things manufacturers who have the goods on hand are advancing their prices with the prospect of still further advances in the near future. The market is thus quotably stronger owing to the scarcity.

**The Palmer Trouser Guard.**—This article, put on the market by Robert T. Palmer, 31 Otis Place, Buffalo, N. Y., was described in our last issue. It is sold nickeled or enameled at 50 cents net per dozen in less than gross lots. In gross lots it is sold nickeled at \$5 net and enameled \$4.80 net.

**Redfield's Towel Holder.**—This Holder, put on the market by J. R. Clancy, Syracuse, N. Y., and described in our last issue, is sold to the trade at \$3.50 net per gross.

**Hendrick's Flanged Steel Screens.**—Hendrick Mfg. Company, Carbondale, Pa., are putting these Screens on the market. They are made of perforated sheet metal and are intended for use in connection with sand, gravel, coal and stone. The Screens are sold from the following list, which is subject to a discount of 40 per cent. Terms, f.o.b. Carbondale:

| No. | Size.               | Light pattern. | Heavy pattern. |
|-----|---------------------|----------------|----------------|
| 1   | 20 x 61 inches..... | \$5.00         | \$6.00         |
| 2   | 22 x 66 ".....      | 5.50           | 6.50           |
| 3   | 24 x 71 ".....      | 6.00           | 7.00           |

Other sizes are made to order.

**Sheet Zinc.**—Matthiessen & Hegeler Zinc Company, La Salle, Ill., since the discount sheet on Sheet Zinc referred to in our last issue have sent out two further changes, each being in the way of reduction. The price continues \$4.50 for Sheet Zinc in 600-pound casks, of the thicknesses between Nos. 9 to 15, inclusive, and of the widths between 32 to 46 inches, and of the lengths between 84 to 90 inches. The extras are also unchanged. The discounts announced, under date April 18, are as follows:

| Discounts.           | First class.<br>15 600-pound<br>casks and up-<br>ward. | Second class.<br>10 to 14 600-<br>pound casks. | Third class.<br>5 to 9 600-pound<br>casks. | Fourth class.<br>Under 5 600-<br>pound casks. |
|----------------------|--|--|--|---|
|                      | Per cent.  | Per cent.                                      | Per cent.                                  | Per cent.                                     |
| Special.....         | 15   | 15   | 15   | 15  |
| Cash with order..... | 3  | 3  | 3  | 3   |
| Quantity.....        | 3  | 2  | 1  | 0   |
| Totals.....          | 21   | 20   | 19   | 18  |

All discounts are computed straight when money accompanies the order. Quantity discount is added to special discount in all cases. If remittance is received within 10 days of date of invoice the cash discount will be only 2 per cent. instead of 3 per cent., and not computed straight. Each order is strictly subject to the quotation of the class to which it belongs.

**Glass.**—There has been no radical change in the condition of the Glass market during the past week, though prices show an upward tendency. An increase is noticed in the number of factories in operation, which would indicate that manufacturers anticipate an increased demand and remunerative prices. A State organization of Indiana manufacturers has been formed, which has resulted in a stiffening of prices in the gas belt. The New York Window Glass market is represented by the following quotations: Single and double strength Glass in small quantities, 80 and 20 per cent. discount; in 1000-box lots, single, 85 per cent., and double strength Glass, 85 and 5 per cent. discount. Pittsburgh factory quotations are reported as 85 per cent. for single, and 85 and 10 per cent. discount for double strength Glass. New York Plate Glass quotations remain 70 and 10 per cent. discount.

## Hardware Organizations.

### Southern Hardware Jobbers' Association.

THE ANNUAL MEETING of the Southern Hardware Jobbers' Association will be held on June 5 in Richmond, Va. Arrangements are making to render this meeting especially attractive, and it promises to be one of the most interesting and important meetings in its history.

The Southern Hardware Jobbers' Association is one of the largest and most influential in the country, having

a membership of about 60 of the leading jobbing firms in the South.

### Hardware Club of New York.

The Postal Telegraph Building, the prospective home of the Hardware Club of New York, is receiving the finishing touches, and it is expected that the club will enter on possession of its premises early in May. The rooms are now almost ready for occupancy, and in one of them the meetings of the Board of Governors, which in view of the many matters calling for attention are called frequently, are held. The

House Committee, upon whom a great deal of labor has devolved in connection with the furnishing of the club, has been increased by the addition of the following gentlemen: Charles Daly, A. G. Sherman and Brace Hayden, the committee now consisting of Peter McCartee, Eugene Bissell, Charles Daly, Brace Hayden, A. G. Sherman, Edward C. Van Glahn and John L. Varick.

### New England Hardware & Iron Association.

A recent change has been made in the scope of the New England Iron & Hardware Association, by which manufacturers as well as merchants will be represented in its membership. Including as the association already does the leading wholesale houses dealing in Iron, Steel, Hardware and kindred lines in New England, it is expected that many manufacturers will become identified with it, thus making it a more thoroughly representative organization of the Hardware and Iron interests.

## Bicycle Notes.

BUFFALO TRICYCLE COMPANY, Buffalo, N. Y., issue a catalogue devoted to their Fleetwing, Envoy and Envoy Scorchers Bicycles, the Fleetwing being a ladies' machine. They will continue to use rolled threads upon double butt and swaged spokes. They are introducing this season the Envoy Scorchers, a wheel designed for scorching purposes. The company continue to manufacture Gem Tricycles, and also illustrate the Perren-Atherton road Wagon, a light road Wagon mounted upon special gearing, supplied with wheels having cushion or pneumatic tires, as desired.

WYETH HARDWARE & MFG. COMPANY, St. Joseph, Mo., issue pamphlets showing the following Bicycles for 1894: Eclipse No. 20; Electric in Nos. 130, 128, 126, 126 C—ladies' wheel, 124 and 124 C—ladies' wheel; Western Nos. 13 and 18; boys' Junior, Pet, Children's Favorite, Sunbeam Scorchers and la-

dies' Sunbeam. The Sunbeam Cycles are sold as their high grade wheels.

BUFFALO WHEEL COMPANY, Buffalo, N. Y., issue a neat catalogue in which illustrations are given of their line of Niagara wheels, including the Century, Maid of the Mist, scorcher, roadster and racer. The machines list from \$100 to \$175.

HARRIS MFG. COMPANY, 381 Main street, Buffalo, N. Y., are putting on the market the Harris Combination Wrench, an illustration of which is given in the company's advertisement in this issue. In this tool are combined a Wrench, Oil Can, Screw Driver and Pump. The tool is described as made of drop forged steel, case hardened. Its weight is 10 ounces, which is referred to as 3 ounces less than the total weight of the different parts separate.

Letters from the Trade.

Selling to the Retailer's Customers.

FROM a house in West Virginia we have the following letter in regard to the frequency with which jobbers and manufacturers have direct dealings with consumers :

Our attention has been especially called to this matter of late by noticing at our depots bales of Wire shipped to individuals who are customers of ours, from firms in Baltimore, Philadelphia and Pittsburgh. These firms have representatives on the road who visit us to sell goods. Now this does not appear to us to be fair dealing, for we find this tends very much to the breaking down of prices and general demoralization of trade, trade we find being more demoralized this season than ever before, and we have greater difficulties to overcome. Ohio factories and dealers are especially given to doing business in this way, as they will furnish special quotations and ship goods to any individual who will write them. These letters are often shown to us by our customers, and we are sometimes told that for a 2-cent stamp they can get prices on anything we have.

Barb Wire in Smaller Reels.

A Hardware house in Virginia make the following suggestions with reference to Barb Wire :

We would suggest to manufacturers of Barb Wire that they should not put up the Wire in very large reels, unless for those who request it. More than once we have ordered and specially requested it shipped in 50 to 100 pound reels, and have instead received the Wire in about 100 to 140 pound reels. It is frequently the case that a customer wants anywhere from 25 pounds up, and even less. Some of these customers live 15, 20 or more miles away, and it is not convenient for us to reel off what they want, nor convenient for them to take so large a reel and return what they do not use, which we often allow them to do. It is the same with Plain Wire, but it does not make so much difference for obvious reasons. At one time we only knew of 63-pound coils, which was a good idea, all coils being of the same weight. The coil required no weighing when getting out to deliver, and the exact quantity on hand could be easily found out without weighing.

Shipping Goods.

In a letter recently received from correspondents in the South the following suggestions are made on differ-

ent matters connected with the shipment of goods :

We would suggest that more attention be paid by shippers generally to marking right weights on packages, so that the proper weights are manifested by transportation companies, which is frequently not the case. Attention should also be paid to the manner of packing goods so that they may come at the lowest freight rate. For instance, some goods packed in barrels come at a much less rate than in boxes. Others could be shipped loose as well as packed, thus saving boxing and freight on boxes. We don't approve of shipping such goods as "Castings," "Chains," &c., which are a cheaper class than those contained in packages. We think manufacturers and dealers should endeavor to have Hardware classed lower. Bills of lading as well as invoices should always be sent and in time to reach the consignee before the goods. Goods should also be packed so as to render the packages as little

wares. We notice that some manufacturers do this and that some agents announce the factories they represent or whose goods they handle. Some also do this on large postal cards, which are sent to customers notifying them of the coming of their salesmen, and we think other houses would do well to follow the example.

Remittance Blank.

H. D. HULL, Hardware merchant, of Troy, N. Y., is using the remittance blank given below. This blank is referred to as embodying recent improvements made by Mr. Hull, and is, it will be observed, of a simple and satisfactory character. At the top of the blank are the words "please receipt and return." Omitting the reference to Mr. Hull's business, the remainder of the blank is as follows :

TROY, N. Y., \_\_\_\_\_ 189

Gentlemen .

Enclosed find my check No. \_\_\_\_\_

in settlement of invoices as per memorandum :

|               |  |  |  |
|---------------|--|--|--|
| For Invoice   |  |  |  |
| " "           |  |  |  |
| " "           |  |  |  |
| " "           |  |  |  |
| Less          |  |  |  |
| "             |  |  |  |
| "             |  |  |  |
| "             |  |  |  |
| Total amount, |  |  |  |

You will oblige by signing Receipt below and returning this statement.

Yours respectfully,

H. D. HULL.

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Received from H. D. HULL, Check for \_\_\_\_\_ as above.

liable to breakage or disfigurement as possible, so that they may present a good appearance on the dealers' shelves. We would also suggest to manufacturers that goods be put up in as convenient quantities as possible, so that small buyers can buy in packages, which would be better for both buyer and seller. Everything else being equal, we buy the goods which are put up in the most convenient, substantial and attractive styles.

Addresses of Jobbers.

It will be observed that manufacturers in their advertisements frequently give the names of jobbing houses from whom the goods can be obtained. The desirability of this information is referred to in a letter recently received from an enterprising Hardware house, from which we make the following extracts :

We would suggest that in advertising manufacturers give addresses of parties in the most important cities from whom dealers can obtain their

A Filing System for Buyers.

THE FOLDING PAPER BOX COMPANY of South Bend, Ind., whose advertisement appears in this issue, offer an ingenious system of filing catalogues and quotations. It is called a "buyer's system of filing" as it is intended specially for use by those who attend to purchasing. The manufacturers of this system supply the boxes necessary for its operation, together with number cards, catalogue cards, gummed labels and an index book which admits of some 8800 entries, supplying ample space for liberal cross indexing. The boxes are of two sizes, 4 inches high by 4 inches wide by 11 inches long and 4 inches high by 12 inches wide by 11 inches long, either paper covered or cloth covered. All the boxes have cloth covered fronts with brass rings for pulling out. A cabinet or shelves to hold the boxes can be made by any carpenter. The company furnish cuts making suggestions as to the arrangement of shelving and the grouping of boxes.



With the boxes numbered and their contents entered in the index book with the box numbers, it is an easy matter to instantly locate any catalogue, circular or quotation. When a catalogue or other document is received, it is assigned to a suitable box and a label bearing the number of the box is pasted on it. Pamphlets and circulars fully describing the operation of the system and its advantages will be sent on application to the company. They refer to a very large list of manufacturers and merchants who have introduced the system into the purchasing departments of their establishments with satisfactory results.

## Electrical Devices as Hardware.

BY W. E. GILL.

IT IS ONLY in recent years that electrical devices have come to be recognized as among the conveniences of the home and the necessities of the hotel, the business house, the bank and the factory. A few modern electrical inventions, notably among which are the telephone and the electric light, coupled with the energy and push of those engaged in the prosecution of electrical enterprises, have been largely instrumental in educating the public to a just appreciation of the value of electricity in domestic and business life. Electricity as applied to the liberal arts has become so extended in this country that a hotel without its guest call or a town without its electric railway, electric lights or the ubiquitous telephone would be considered commonplace indeed. Until recently electrical goods, with but few exceptions, have been handled and vended by manufacturers and dealers who made it their special business and who devoted their entire attention to the electrical industry. This was perhaps necessary while the goods were passing through their infantile period, and the same would apply to any like industry at the same stage. In many of its branches the electrical business will of necessity remain so, requiring as it does a special training to enable one to follow it successfully. There are, however, a great many articles and devices which are in constant demand almost everywhere, which have been so simplified as to render them staple.

### WE WOULD CAUTION

the Hardware merchant who contemplates adding electrical goods to his already varied and diversified stock against going too far at the beginning. Location and the extent to which electrical enterprises are being carried on should have much to do with the choice of a line. Buy only from manufacturers or dealers of known and acknowledged reputation. There is, perhaps, no line of goods carried in stock by the Hardware merchant which he will be less able to criticize than his electrical stock. He must therefore rely upon the manufacturer or jobber giving him fair value in the goods they furnish.

### THE INSTALLING

of electric railway and electric lighting plants, also fire alarm systems, is being

generally carried on by companies organized for the promotion of some special system, the apparatus for which is usually patented or controlled by them. This work of necessity requires more or less scientific knowledge and men trained in special branches to perform the work. There is much, however, that comes within the scope of the Hardware merchant, and that could bear the same relation to his business that the tinshop and furnace department now do. The extent to which he should engage in electrical work of course depends upon existing conditions. In a locality where there are electrical fitters, the merchant might find it more profitable to carry a limited stock of staple goods, so as to be able to supply the wants of the local trade, rather than to engage in competition with them. In this way he would avoid coming in contact with the consumer and avoid many of the petty annoyances incident to the electrical fitters' business and which arise from causes not under his control. All electrical devices depending upon a battery as the source of the electric current require

### OCCASIONAL ATTENTION.

The battery must be supplied with water, and the elements when used up must be replaced by new ones. These simple matters are very apt to be neglected by the consumer, and when the electrical service fails, he invariably resorts to the fitter, who must needs make a trip to do what the consumer or his servant might have done had they been properly instructed. The merchant will indeed find more of these petty vexations to contend with in the electrical fitting department than in any other branch of his business. In the event of his adding an electrical fitting branch he should first acquaint himself with the simpler house appliances; the most common of which is the electric bell. There are manufacturers who have made a special study of the requirements of the Hardware trade in electrical devices for domestic and business purposes, and who put up and furnish in the most convenient form the goods which are in common demand everywhere, packing them in sets to suit most all ordinary requirements, and in such a form as to be readily stocked and handled from the shelf in the same manner that the merchant would handle a set of sliding door hangers or a set of store door handles and lock. The necessary directions are to be found packed with the sets, making it easy for a person of ordinary intelligence to put them in place in working order and to care for them without assistance from any one.

### WHAT TO CARRY IN STOCK.

To start with, a merchant should place in his stock a few electric bell sets, such as are used for front doors and dining rooms in residences, for calls in office, banks, factories, stores, &c., selecting those sets which are packed with trimmings best suited to the requirements of his particular

locality. These sets come packed with sufficient electrical wire for connecting up in any house of moderate size. In a great many instances, however, more wire will be required than is packed with the sets. It will, therefore, be desirable to carry some electrical wire in stock, such as is commonly used and known as No. 18 gauge annunciator, on spools of, say,  $\frac{1}{2}$  pound or 1 pound each, which sizes are regular; also  $\frac{1}{2}$ -inch electricians' staples, in 2 ounce packages, packed one dozen packages in a box; and for repairs, some complete batteries and parts of batteries, such as battery zincs and sal ammoniac, in 5-ounce paper boxes or bags, one package being the quantity required for one complete charge for a single battery. A very simple, comprehensive and comparatively inexpensive sample for the sales-room may be made, using the wood box in which the set is packed, by screwing the cover to the back of the box, so as to extend above the box and mounting thereon the bell, wire and push, and placing the battery inside the box, all in full view; the battery then being charged and connected to the bell and push with the wire, and by pressing the push knob the bell will be made to ring, the current passing through the entire coil of wire. These electric bell sets should be on the shelf of every Hardware merchant, whether he does fitting or not, as they will meet the requirements of the average house builder or contractor in need of a simple electric bell, they being in the most convenient shape to handle and carry in stock. Should the merchant desire to engage in the

### FITTING BUSINESS,

or carry stock for local fitters, he will find it convenient in addition to the sets to carry a limited line of electric pushes in bronze for out of doors, and wood for indoors; iron frame bells with 3-inch gongs for ordinary house and office use, and larger for barns, mills, factories, stores, &c., according to requirements; complete electric batteries and parts for same; No. 18 electrical wire on spools of  $\frac{1}{2}$  pound, 1 pound and 8 pounds each;  $\frac{1}{2}$ -inch electricians' staples in 2-ounce,  $\frac{1}{2}$ -pound or 1-pound packages; electric door connections for use on store entrance doors to indicate the opening and closing of the door; dining room pushes to be operated with the foot for calling a servant during meals, &c. The foregoing list comprises the goods which are in most common demand where electrical devices are used. There are other and kindred lines such as annunciators for hotels and residences and electric gas lighting apparatus which it would be manifestly unwise for the Hardware merchant to handle as a selling stock, and rather beyond his ability to handle as a fitter until he thoroughly understands how to install electric bells in their various applications. Regarding equipments and supplies for electric street railway and electric lighting plants, it would be impossible

to here specify what goods might be advantageously handled, as local existing conditions and requirements and the knowledge of the merchant in these special branches of electricity will alone determine.

### Business Methods.

**W** E RECENTLY published a communication from a Hardware house in which the desirability of having a broader margin on invoices was referred to, the object of such margin being to receive markings as to the receipt, disposition of the goods, &c. This suggestion has called out the following communication from a manufacturing concern in Chicago. This letter is of interest as showing the business methods adopted in connection with invoices:

I noticed the article headed "A Broader Margin Wanted," relating to invoices, in order to give space for buyers to make memoranda thereon. The design shown is so similar to this company's practice that I imprint hereon an impression of a rubber stamp, the blank spaces being filled out to show specimen notations that an invoice bears when returned to the office by the receiving clerk:

Rec'd. 4/13/94 By J. Smith  
Via Adams Ex Charges 30¢  
Charge to Store Room

Each invoice as it arrives in the secretary's mail is by him entered in pencil on a memorandum book, showing date, name and amount, the page of the memorandum being noted on a back corner of the invoice.

It is then turned over to the chief clerk, who applies the stamp referred to and delivers the invoice to the stock keeper who is in charge of that particular class of material. This indicates that it has passed the chief clerk's desk and gives him the "run" of invoices in circulation. When the bills are vouchered the fact is shown on the memorandum by the use of a rubber stamp bearing the word "Vouchered," the page number on the back of the invoice (heretofore referred to) giving ready reference.

A prime use of the memorandum is to enable us to report to the treasurer weekly for financial reasons the amount of bills not vouchered, which is readily ascertained by disregarding all items stamped "Vouchered" and taking into account only those shown as open.

When the secretary receives the monthly statements he locates the items on the memorandum, using check marks on same to indicate that statement has been received and that the individual items agree, at the same time entering on the statement in connection with each item the page of the memorandum on which it appears. This gives the secretary a check on the transactions without referring to the invoices themselves, unless differences exist, and satisfies him that invoices have been received for all the items on the statement.

All of the operations referred to above are in actual practice with us and are really not so cumbersome as might appear at first sight.

## The Retailer's Advertising.

### Hints and Maxims.

FIRST SERIES.

BY AN EXPERT.

1. Ninety-nine per cent. of all advertisers say too much in their announcements and use too many words.
2. The advertisement that tells is the advertisement which in whole or in part can be observed at a single glance and which contains one emphatic word or sentence which induces the reader to read the whole advertisement.
3. A successful advertisement is generally of two parts, the heading or head lines and the descriptive matter. The heading of every advertisement, particularly if the space be limited, must be so short and contain so few words that it can easily be read at a considerable distance and cannot escape the eye glancing over the page.
4. Fortunate is the man who can invent one word for a heading, for one word is better than two, and two are better than three.
5. Better have the majority of readers read a short advertisement

than to have a few readers read the whole of a long advertisement.

6. If you could frame a bill and have it become a law that people were obliged to read your advertisement, then you might print a catalogue of your goods in the papers and make money doing so, but so long as they will not wade through a lengthy advertisement you must give them just as much as they will read, no more, no less.

7. If only one article is advertised at a time, any one seeing the advertisement and wanting the article is liable to go to the store to buy it.

8. It is by no means improbable that such a buyer may become a transient and perhaps a regular customer.

9. He who wants a certain thing notices the advertisement that presents that thing to the exclusion of other things, and feels that the advertiser is making a special effort to sell it, which indicates that he is selling it for less than the regular price, or that he has a superior article at a regular price.

10. There is no objection to enumerating the articles you sell at the bottom of the advertisement in small type, but an advertisement should seldom present conspicuously more than one article or two articles at the most.

11. Wherever it is necessary to present more than two, better divide the advertisement into distinct sections,

each one complete in itself and each one devoted to some particular line.

12. The advertisement should leave something for the salesman to say. Advertising does not sell goods—that is the salesman's business.

13. Never use fancy or script type in an advertisement. There is nothing like Gothic or full faced letters for an advertisement. They are easily read and do not occupy more space than they deserve.

14. You have something to say. Say it as you would in a telegram. Your strong words first and almost as strong words last, and fill in between with the smallest number of words to give people an idea of your meaning.

15. Don't tell them too much. Make it so that they will be surprised when they see the goods.

16. Two examples of advertisements are added below. One represents the average newspaper advertisement. The other presents but one article in the briefest manner and in such a way that it attracts attention.

## JOHN SMITH,

Dealer in

Hats, Caps, Furs,  
Choice Groceries, Fine Teas,  
Nails, Screws, Hardware,  
Buggies, Wagons, Carriages,  
Boots, Shoes, Rubbers, Watches,  
Clocks, Silverware, Jewelry, Every  
Variety of Dry Goods, Drugs, Chem-  
icals, Patent Medicines, Chamber Sets,  
Parlor Suits, Rattan Chairs, Pipes,  
Cigars and Tobacco, Electric Fixtures  
and Lamps and Books.

## JOHN SMITH,

44 SMITHVILLE AVE., SMITHVILLE.

NOTE.—Cottage house, half mile from depot, ten rooms and bath, stable connected, 15,000 ft. of land, for sale cheap.

One Style of Advertisement.

# WANT A RAKE

We sell as low as  
we can—lower than  
ever before.  
We have too many.  
We are after cash.

JOHN SMITH, 44 Smithville Ave.

Another Style of Advertisement.

## Arrangement of Stores.

F. P. CARUTH.

F. P. Caruth of Orange, Mass., has recently fitted up a new store in which the arrangement is excellent, being the result of careful planning and several years' experience. The store is 83 feet deep, 20 feet wide in front and  $24\frac{1}{2}$  feet wide in the rear, with a light and airy basement 2 feet longer than the room above, the

center and from the center to the back, with a depression at the center to receive the spool. This is a convenient method of handling Belting for retail purposes, while the cabinet is an attractive addition to fixtures. The office is located back of the stairway and extends about two-thirds of the distance across the room. The office is 15 feet deep and is provided with safe, desks, typewriter, cashiers' window, copying press, &c. Inside the office is a den or

the times in their illustrations. They furnish the dealer with six or eight little books representing as many different lines of Hardware very poorly classified, while the Americans give all in one well illustrated book, making it easier for the dealer to make selections, and also almost certain that he will receive just what he ordered.

Commenting on the above the London *Ironmonger*, recognizing the superiority of American catalogues and the wisdom of the course thus pursued by American manufacturers, remarks:

Many of the catalogues of British manufacturers are not nearly so well illustrated as they should be; and, taken as a whole, we are disposed to agree with the statement that the American catalogues are better done. This may or may not be the result of superior printing or better engraving in the United States; but, be the cause what it may, it is a pity that our manufacturers should be behindhand in a matter of such real importance. We have now before us a pile of American catalogues, and, although a few of them are gaudy and too florid, the great majority are beautifully got up, in convenient sizes, on good paper, and with illustrations which are generally of the very highest class. Why should not British manufacturers follow suit? Surely our engravers, process block producers and printers are equal to the performance of really first-class work! If not, then orders can be given to American or German printers until our own typographers and engravers are made to appreciate the necessity for keeping themselves thoroughly up to date. We suspect, however, that the fault is not so much with the printers and illustrators as with the manufacturers themselves. They are not so wideawake as they ought to be—and will have to be before long—to the absolute necessity of placing before buyers finished pictures

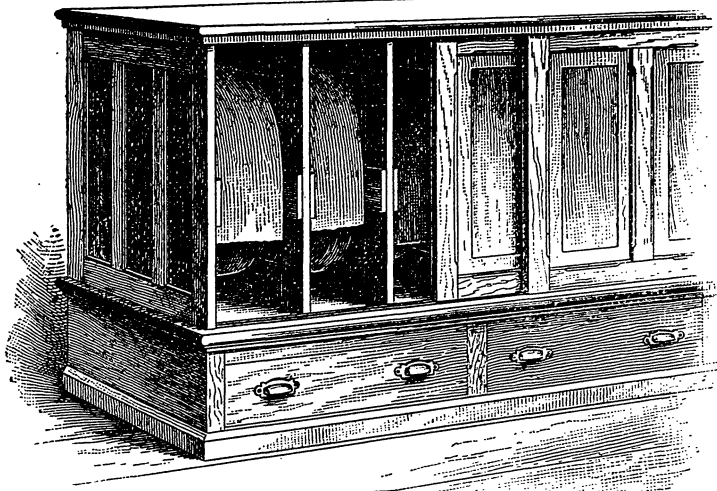


Fig. 840.—Belt Cabinet.

two rooms having a floor space of over 3650 square feet. Deep show windows in front give a fine opportunity for the display of goods, and there is also ample light at the rear and on the south side, where the office is located. The ceiling is of wood and the walls above the shelving are tastefully tinted. The store fixtures are of quartered oak finished in the natural wood. On one side of the room is shelving, fitted with drawers part way up, above which is duplicate stock in original packages. At the front, on the opposite side of the room, are six wall cases, each 5 feet wide and 6 feet high, lined with black cloth, and each covered with double sliding glass doors. The cases show samples of Fishing Rods and Tackle, Sporting Goods, Carpenters' Tools, Machinists' Tools, Cutlery and Brushes. Counters with showcases extend back on each side about two-thirds of the distance from the entrance to broad stairs descending to the basement. Abutting against the railing surrounding the stairway, with the openings to the front, stands the Belt cabinet shown in Figs. 840 and 841. The cabinet is about 3 feet deep, 4 feet high and contains 15 partitions, to accommodate Belting from 1 inch to 8 inches in width. The drawers underneath are used for Cut Lacing. The doors are provided at the bottom with wheels which run on brass rods and are guided at the top by dowels. The back of the cabinet is inclosed with  $\frac{3}{8}$ -inch sheathing, and the top is of  $1\frac{1}{4}$ -inch stuff. The construction of the partitions is shown in Fig. 841; they are made of  $\frac{3}{8} \times 4$  inch boards. The dotted lines represent a half piece glued on to the cross piece, upon which the 3-inch hardwood spool revolves. This piece inclines from the front to the

private office 5 feet 6 inches by  $9\frac{1}{2}$  feet in size, provided with a desk, chairs, &c. The space between the larger office and the north wall is utilized for Carriage Bolts, Coach Screws, &c. A revolving Bolt case stands near the entrance, and a 2 x 4 foot counter near the center of the room, while the walls are lined with shelving. The basement is used and fitted up for Paints, Oils, Steel Goods, Woodenware, Horse-shoes, Nails, Barn Door Hangers, &c. Under the front sidewalk is a Glass rack capable of holding a large stock of Glass, with a Glass cutting table near it. The doors at the rear of the basement are wide enough to drive or back in a two-horse team, and here all freight will be received and all heavy goods delivered. The store arrangement and fixtures were planned by the proprietor and the establishment is referred to as among the largest and most finely finished in that section of the country.

## American Catalogues Abroad.

A RECENT REPORT from the United States Consul at Hamilton, Bermuda, refers in the following terms to the excellence of American catalogues as compared especially with those of English manufacturers:

I find that the American catalogues are very much better illustrated than the English, which in many instances give the American goods the preference, although the English goods may often be a little cheaper. In ordering from the English catalogues, owing to their not being well illustrated and numbered, I often get something entirely different from what I ordered, and, in many cases, making dead stock. The English are much behind

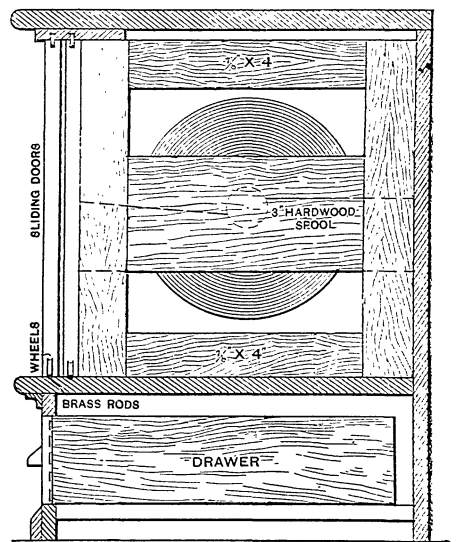


Fig. 841.—Sectional View of Belt Cabinet.

of their goods. The Americans have been alive to this for years past, with the result that their excellent engravings and good catalogues have sold far more articles in the neutral markets than would otherwise have been the case. It is said that "a word to the wise is sufficient." In this case we hope it is, for we are sure that it is a manifestation of most sincere friendship for our own manufacturers to tell them that as regards their blocks and catalogues they must improve very considerably and very quickly if they mean to hold their own against their American and foreign rivals.

## A Convenient Oilcloth Rack.

THE ACCOMPANYING CUT, Fig. 842, represents an Oilcloth rack in use in the establishment of Shelly Brothers & Co., Bancroft, Mich., and solves the somewhat perplexing question of how oilcloth may be kept in a compact and convenient manner for exhibiting and retailing. The frame work of pipe stands on a platform about 7 feet long, mounted on wheels, so it can be easily moved to any part of the store. The bottom piece of the rack in front is of 1-inch gas pipe, 6½ feet long. The uprights are formed of 12-inch pieces of 1-inch pipe, put together with cross T's. The cross pieces or axles on which the oil cloth is hung are made of ¾-inch pipe, with lock nuts on both ends, and are run through the T's. The braces at the back are connected to the cross

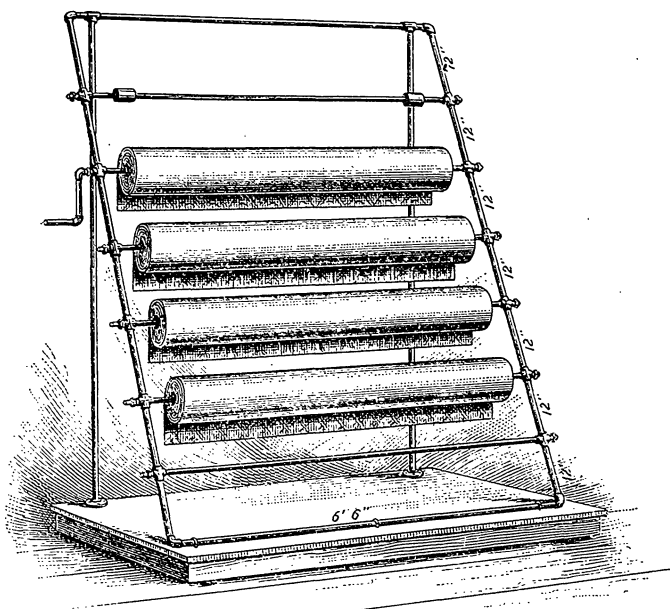


Fig. 842 — A Convenient Oilcloth Rack.

piece at the top of the rack by the use of T's, and at the bottom are fastened to the platform by plates. A crank is made of ¾-inch elbows and nipples. Holes are bored through cylindrical blocks of wood, two of which are used on each axle at the ends of the cloth, as shown on the upper one in the cut. When putting on a roll of oilcloth one of the lock nuts is removed from the axle, which is then passed through the oilcloth, and a tack is driven through each corner of the cloth into the blocks on the axle. The rack has been in use for two years, giving, we are advised, perfect satisfaction. When the season for oilcloth is passed the rack is hung on rods 2 feet long, suspended from the ceiling, and is utilized for piling unseasonable goods on.

THE TRADE will observe the advertisement in this issue in which the Amidon Tool Corporation, 1451 Niagara street, Buffalo, N. Y., for whom John H. Graham & Co., 113 Chambers street, New York, are agents, call at-

tention to the fact that they are manufacturing a complete line of Bit Braces, an illustration being given of their Corner Brace. This company are and have been for the past two years under the management of their president and treasurer, C. S. Dumont.

## Trade Items.

GOODELL COMPANY, Antrim, N. H., have recently added several new patterns to their line of Carvers, also several new patterns of Table Knives and Forks. They are just putting on the market a new Kitchen Knife, on the handle of which is stamped the word "Potato." This is referred to as a well finished article made from the best material, to meet the demand for a thoroughly good Kitchen Knife.

THE INDEPENDENT ELECTRIC COMPANY, Thirty-ninth street and Stewart avenue, Chicago, advertise in this issue their Goodhue Combination Cycle Lock, which they offer for the use of bicycle riders, traveling men,

tained from the most accessible standard authorities. The tables cover a wide range of subjects and deal with all trades.

THE PITTSBURGH WIRE COMPANY, Pittsburgh, Pa., manufacturers of Wire Rods and Wire of every description, will remove their Eastern office on May 1 from 7 Warren street to the new Postal Telegraph Building, 253 Broadway, corner Murray street, New York. James A. Farrelly, who is the Eastern sales agent of the company, advises us that they have increased their facilities for making special Wires, and are now in a position to fill all orders promptly for their mild steel Bolt, Rivet and Screw Wires.

AMERICAN STAMPING COMPANY, 104-106 John street, New York, are now manufacturing at their Brooklyn factory, in addition to regular lines, standard sizes of Ash Cans, cast iron enameled Cuspidors, Mule Stock Pails, sheet iron galvanized Water Pails, together with a full line of Galvanized Sheet Iron Ware, silverine embossed Trays and galvanized sheet steel Tea Kettles. They direct attention also to the fact that they have commenced the manufacture of all kinds of Deep Stamped Ware for enamellers.

PECK, STOW & WILCOX COMPANY, 27 Chambers street, New York, have brought out a popular Family Soldering Set, which is offered as a convenience for doing odd jobs around the house. It consists of a ½-pound copper, handled, the copper portion being tinned all over, three strips of solder and a round tin box with cover containing a supply of rosin. The kit is inclosed in a neat wooden box with sliding cover.

## The Problem and Its Solutions.

WE ARE still in receipt of replies to the question in regard to the settlement of the account published in *The Iron Age* of March 29, but the pressure on our space prevents us from printing them, especially as most of those which we have received during the past week have substantially the same conclusions as were reached by some of the earlier correspondents. The following letter, however, will be of especial interest, referring as it does to the answers which were published in *The Iron Age* April 5. The different solutions there presented are, it will be observed, acutely analyzed by our correspondent, who is a prominent Hardware merchant of the Pacific Coast.

I have been interested as well as amused in looking over the solutions furnished by various parties of the "problem regarding the settlement of account" in your issue of 29th ult.

As I read the question, the return of the first lot was the result of fault of B in the execution of the order. That being the case, and the goods being delivered at A's place of business free of cost to him for freight, as a matter of course the return freight also should be at B's expense.

Solution A answers the requirements excepting in one particular. The contributor estimates the freight allowance (actual freight, presumably) on the second shipment, although a larger one, at the same amount as on the first. I suppose in the absence of weights and rates he simply meant that the actual freight, whatever it might be, should be deducted in the settlement. The contributor of Solution D undertakes to adjust this item by the

owners of pleasure boats, &c. No two of these Locks are alike, there being more than 10,000 combinations. They can easily be operated in the dark, and no key is required. They are strongly made and highly finished. Parkhurst & Wilkinson, Chicago, are general Western agents.

SPECIALTY MFG. COMPANY, Hartford, Conn., have appointed David Eastman as their New York agent, with office at 64 Reade street. Here will be carried a full stock of the company's goods, including the Columbia Tack Hammer and Puller, Columbia Tack Puller, Columbia Nail Puller and Hammer, Black Hawk Nail Puller, Hartford Nail Puller and Boss Barrel Opener.

THE NEW YORK WIRE CLOTH COMPANY have recently moved their general offices from 53 to 102 Chambers street, New York City.

THE REPAUNO CHEMICAL COMPANY, Wilmington, Del., report a large demand for their "Atlas Memorandum and Reference Book," which they published early this spring. The book contains 163 pages of tables and useful information for practical men, ob-



rule of proportion, but after all it is only an estimate, and he also would in an actual transaction use the exact figures. Adopting D's idea of a proportionate freight charge, A's final figures would be \$71.50 instead of \$74.

In Solution B this question is avoided by providing for deduction of "any freight charges he may pay on the \$500 shipment," leaving the amount to be ascertained. But in this solution the back freight on goods returned is wholly ignored, although it is assumed that B "was at fault in first shipment of goods." If this ground is taken, it seems to me that the return should be at B's expense, and that the remittance should be \$84 instead of \$74, subject to further deduction of freight on the \$500 shipment (and interest, if any).

In Solution C the purchaser is made to stand both freights on the first shipment, since he is only credited with first payment of \$366, although he was entitled to \$10 more for freight and also to the freight back.

The ledger account should stand thus :

|                       |                                  |
|-----------------------|----------------------------------|
| Merchandise..\$400.00 | Freight.....\$10.00              |
| " 500.00              | 6 per cent. discount..... 24.00  |
|                       | Cash.....366.00                  |
|                       | Return freight 10.00             |
|                       | Freight on second shipment 12.50 |
|                       | Merchandise returned.....400.00  |
|                       | 6 per cent. on \$100..... 6.00   |
|                       | Cash.....71.50                   |
|                       |                                  |
| \$900.00              | \$900.00                         |

You will see the final entry in Solution C is a credit of \$8.50, which is an amount not readily deduced from any of the conditions of the problem, and smacks somewhat of "forcing" a balance.

In Solution D an element of interest is introduced. I don't think the propounder contemplated a question of interest, as he made no suggestion of it; the delay of two months was the delay of the purchaser in "finding" the defect, and the rule is to limit the time for reporting errors to, say, ten days after arrival. In all probability he had time to check his invoice and inspect his goods before sending his check. However, admitting the interest, a further deduction of \$10 back freight is in order, leaving settlement to be \$68.33 instead of \$78.33.

Solution E allows \$84 in final settlement, subject to claim for cartage on first lot and interest for one month, but admits that B could justly claim that defect should have been discovered sooner. I have stated in my remarks on Solution D why interest should not be allowed, but if I am mistaken and there should be a claim for interest, then the 50 days—that is, two months' time less 10 days—is a period justified by the conditions, while one month is a "jump" estimate savoring of arbitration or "splitting of difference" rather than a result of figures. This solution (E) does not allow the \$10 back freight, unless that is what he intends when he says A could if he so desired claim cartage on the first shipment. This I hardly feel warranted in assuming, and so am of opinion his solution should be corrected in this regard so as to read \$74 instead of \$84.

## Price-Lists, Circulars, &c.

**THE IOWA FARMING TOOL COMPANY**, Fort Madison, Iowa: Export illustrated catalogue No. C. The catalogue illustrates, with prices, a line of Cradles, Forks, Hoes, Rakes, Manure and Potato Hooks, Walk Cleaner and Turf Edger, Shepherd's Crook, &c.

**THE INTERCHANGEABLE TOOL COMPANY**, Utica, N. Y., W. W. Pryor & Co., 81 Chambers street, New York, agents for New York, New Jersey and New England: Hall's American Nippers, Pliers, &c. A line of Hall's goods is shown, including Compound Lever Nippers; Adjustable Face Vises; Telegraph, American, Center Cutting, and Side Cutting Pliers; Champagne Wire Cutters; Diagonal Cutters; Telephone Pliers; End Cutting Nippers; Compound Seal Press and Side Cutting Burner Pliers. The Side Cutting Burner Pliers and the Diagonal Cutters with double cutting faces are recent additions to their line of tools.

**HARBER BROS.**, Bloomington, Ill.: Buggies. An illustrated catalogue and price-list shows a line of Buggies, Farm and Spring Wagons.

**W. N. DURANT**, 237 Twenty-second street, Milwaukee, Wis.: Blotting pad with calendar for April and references to Durant's Counters.

**E. C. MEACHAM ARMS CO.**, St. Louis, Mo.: Catalogue No. 571. Sporting Goods, with discount sheet.

**THE BOURKE MFG. COMPANY**, Youngstown, Ohio: Hardware Specialties. An 1894 catalogue and price-list shows ventilating and diagonal Sash Locks, Window Cleaners, Handle Couplings, Floor Scrubbers and Dryers, Bar Cleaners, and Combination Brush Mop and Sponge Holder.

**CHAMPION IRON & WIRE WORKS**, Omaha, Neb.: Iron, Wire and Brass Work. A large sheet illustrates a line of Wire, Iron and Brass Goods, including Fences, Stable Fixtures, Bank Railings, Flower Pot Stands, &c.

**THE UNITED STATES WIRE MAT COMPANY**, Decatur, Ill.: Catalogue of Wire Mats, showing the variety of styles for all uses manufactured by this company; also the Rapid Spiral Screw Driver.

**THE LEACH ROASTER AND BAKER COMPANY**, Paxton, Ill.: Circulars descriptive of specialties manufactured by this company, viz.: The Abell Coffee Pot, the Lebanon Beater for beating eggs, mashing potatoes, &c., the Travers Improved Roaster and Baker, the Perfect Cooking Mat and Griddle, the Ristedt Patent Combination Utensil Holder, the Sensible Chopping or Mincing Knife, the Perfection Cake and Pie Tin, the Midget Umbrella Holder, the Magnet Broom Support, the Cook Rotary Grater and Slicer, the Lebanon Cake Cutters, the Poached Egg and Vegetable Lifter, the Perry Separable Perfection Cake Pan, the Paxton Bread, Cake and Layer Cake Pans, the Little Monitor Tea and Coffee Cooker, and the Leach Improved Roaster and Baker.

**THE G. M. SHIRK MFG. COMPANY**, 112-114 Lake street, Chicago, William A. Stokes & Co., 30 Warren street, New York, agents: North Star Refrigerators. An 1894 illustrated catalogue and price-list shows a line of these goods in a variety of styles and sizes.

**ETTE & HENGER MFG. COMPANY**, St. Louis, Mo.: Plumbing and Waterworks Catalogue, No. 5, May, 1894. The catalogue and illustrated price-list contains 174 pages, bound in cloth, and is devoted to Plumbing and Waterworks Specialties. The manufacturers state that they have recently increased their manufacturing facilities in all departments and have added several new ones, and are now in a position to furnish goods upon favorable terms and in the shortest possible time.

**MAST, FOOS & Co.**, Springfield, Ohio: Catalogue No. 10. The catalogue and price-list, containing 144

pages, is bound in cloth, and illustrates, in almost complete form, the line of goods manufactured. In the line are included Buckeye Force Pumps, Iron Turbine Wind Engines, Columbia Steel Wind Mills, Steel Wind Mill Derricks, Buckeye Steel and New Buckeye Lawn Mowers, Iron Fencing, Cresting, &c.

**WILLIAM P. KELLOGG**, Troy, N. Y.: Mortising and Boring Machines. A pamphlet illustrates a foot-power Mortising Machine, the Parmelee Upright and Angle Boring Machines and the Kellogg Upright and Angle Boring Machines.

**THE REPAUNO CHEMICAL COMPANY** of Wilmington, Del.: A 31-page pamphlet addressed to farmers entitled "How to Increase the Value of Your Land, by the Removal of Stumps and Boulders." The pamphlet fully describes the best methods for removing stumps and boulders by the use of explosives, and illustrates the placing of a charge and the effect of a blast. The pamphlet also treats of frozen cartridges and the methods employed in thawing them; blasting log jams and rollways; blasting ice; sinking wells, and electrical blasting. The Powder recommended in these operations is the Atlas Powder, made by the company, and which they state has been for many years a standard in mines and public works. The book also contains a page illustrating the different tools and materials used by farmers for blasting purposes.

**C. SIDNEY SHEPARD & Co.**, Chicago: Spring circular of seasonable and other goods. The circular is devoted to Water Coolers, Freezers, Milk Can Stock, Milk Kettles and Pails, Japanned Goods, Mica, Oil Stoves and Lamps, Oil Cans, Tin Plate, Galvanized Iron, Eaves Trough, Cement Coated Wire Nails, &c.

## It Is Reported—

### Colorado.

That the copartnership heretofore existing between E. Harris Jewett and C. A. Crane, under the name and style of the Midland Hardware Company, COLORADO CITY, has been dissolved by mutual consent, Mr. Crane retiring. The business will for the present be continued by Mr. Jewett alone.

That C. E. Day's Hardware store, at DENVER, was robbed of a quantity of Cutlery on the 7th inst.

### Illinois.

That John Nickle, ALGONQUIN, has sold his stock of Hardware to a Hampshire concern.

That burglars broke open the safe of Titsworth & Powell, Hardware merchants of AURORA, on the night of the 17th inst., and secured \$50 in cash; \$200 worth of goods were also stolen.

That the Hardware store of Keller & Co., EDWARDSVILLE, was burglarized on the 9th inst.

That Knapp & Schock, PEARL CITY, the new Hardware firm, are now ready for business at Yeager & Son's old stand.

That F. M. Clark has bought a Hardware store at CAMP POINT.

### Indiana.

That the Hardware store of J. S. Bowers & Co., DECATUR, was burglarized on the 17th inst., and about \$65 worth of goods taken away.

That Kaufman E. Funk has purchased the remaining stock of Hardware of Keen Bros. & Krupp, ELKHART, and will continue the business at the old stand.

That W. W. Foulke & Co., RICHMOND, who have been identified with the Hardware business for many years, have closed out, Mr. Foulke retiring. The stock has been purchased by the Jones Hardware Company.



**Iowa.**

That L. Farnham has bought the Hardware and grocery stock of C. Dean, ROCKFORD.

That Peter F. Klein of CALMAR has bought a half interest in a Hardware store at VOLGA CITY, Clayton County.

That Alexander Weir has disposed of his Hardware business at MONTEZUMA to A. A. Brown of STUART.

That C. L. Becker's Hardware store at KEOKUK was robbed on the 10th inst.

**Kansas.**

That W. W. Work has traded his residence and business in ERIE for J. M. French's \$14,000 stock of Hardware at TOPEKA.

**Michigan.**

That F. H. Darrow of TEKONSHA has added a stock of Hardware to his tin business.

That the entire stock of the Muskegon Hardware Company of MUSKEGON has been transferred by C. H. Hackley and the Geo. Selkirk estate to John H. Banning and Frank Alberts.

That the interest of Mr. Pettit, recently deceased, in the Hardware firm of Pettit & Minnie, EATON RAPIDS, has been purchased by Merton P. Bromeling, who will discontinue his business recently started at Onondaga and remove the stock to EATON RAPIDS.

That fire destroyed the Hardware store of H. Soames, MAYVILLE, on the 13th inst.

**Minnesota.**

That E. H. Dunton of Ludden, N. D., has traded his stock of Hardware for that of the Annandale Hardware Company of ANNANDALE.

That the Hardware store of Tennis & Plummer, PARK RAPIDS, was entered by burglars on the 12th inst. and some Shot Guns stolen.

That the Hardware store of Alderman, Sylvester & Eiseth, CROOKSTON, was damaged by fire on the 15th inst. The loss on building and stock was about \$1600, fully insured.

That Wood & Co., Hardware dealers at St. LOUIS PARK, have removed their stock to PINE CITY.

That D. Shutt has bought a half interest in G. J. Dunford's Hardware business at CANTON.

That R. A. Ferris of GRENADA has completed a deal with T. G. Tomlin for his half interest in the Hardware business of Tomlin & Fields, at LAKEFIELD.

That the Hoppin Hardware Company, DEXTER, have commenced the erection of a large brick building which they will occupy on completion.

**Missouri.**

That the Hynson Hardware Company of St. LOUIS have filed articles increasing their capital stock from \$15,000 to \$30,000. The assets of the concern are given as \$30,000 and the liabilities as \$16,632.15.

**Nebraska.**

That sneak thieves broke into the Hardware store of George Scheidel, PLATTE CENTER, on the 9th inst. and carried off about \$200 worth of goods.

That burglars on the 9th inst. forced open a window in the Hardware store of Furlong & Eustice, AUBURN, and got away with \$50 worth of Revolvers and Cutlery.

**New Hampshire.**

That the firm of F. E. Wallace & Co., Hardware dealers of ROCHESTER, have dissolved partnership, Frank E. Wallace and Henry L. Berry having purchased the interest of E. G. and E. Wallace. The business will be conducted by them under the same firm style as formerly.

**New York.**

That Charles Taylor has purchased his father's Hardware business at ADISON.

**North Dakota.**

That the Annandale Hardware Company of ANNANDALE, MINN., have exchanged their stock for that of E. H. Dunton, at LUDDEN.

**Ohio.**

That the Hardware store of J. D. Inderieden, at LARAMIES, was broken into by burglars on the 16th inst., and \$500 worth of merchandise taken away.

**Pennsylvania.**

That early on the morning of the 17th inst. burglars blew open the safe in D. M. Rickabough's general store at MILLERSTOWN, and set the store on fire. The building and the entire stock of Hardware, groceries, &c., were destroyed. The loss is about \$15,000, with insurance of \$8000.

**South Dakota.**

That G. F. Reinick has sold his Hardware store at CANISTOTA to Albert Staples.

That L. K. Phillips of SPENCER, IOWA, has purchased a Hardware store at YANKTON.

That Dickson & Taylor have opened a new Hardware store at ARMOUR.

That the Acme Mfg. Company, PEKIN, ILL., have established a large wholesale house at HURON, for the convenience of Agricultural Implement dealers in North and South Dakota.

**Texas.**

That E. Hauser's stock of Hardware at HEMPSTEAD, Waller County, was almost totally destroyed by fire on the 15th inst. Loss, \$7000; insurance, \$4500.

**Vermont.**

That William Patrick has sold his interest in the Hardware business of Read & Patrick, HINESBURGH, and is about to move to ELWOOD, NEB. Thomas Cassidy has bought Mr. Patrick's interest.

That R. S. Hooper of GROTON has bought a Hardware store in HARDWICK.

That the Hardware store of Howard & Brown, LUDLOW, was broken into by burglars on the night of the 14th inst. and a quantity of Pistols stolen.

**Wisconsin.**

That the Frank Leach Hardware Company, OSHKOSH, have been incorporated with a capital of \$2000. The incorporators are F. J. McPherson, F. A. Leach and R. M. Burtis.

That the Hardware store of I. Miller, PLYMOUTH, was recently damaged by fire.

That C. J. Putnam has purchased J. M. Laube's interest in the Hardware store of Laube & Hahn, BRODHEAD, and the firm style has become Putnam & Hahn.

That the Hardware store of John Crook, REEDSBURG, was burglarized a short time since, \$300 worth of goods being secured by the thieves.

That burglars entered the Hardware store of John Crook, at REEDSBURG, a short time since and secured \$300 worth of goods.

That the Hardware store of E. P. Laugesen, FLORENCE, was entered by burglars on the 17th inst., and \$20 worth of goods stolen.

**Paints and Colors.**

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

**White Lead.**—There is not a new feature in the market. The various manufacturers are making prices to suit conditions. The latter contrast in no marked degree with what has been the rule since the opening of the spring season. There is a wide variety of list

prices, quite as much variety in actual or promised discounts, rebates, &c., and upon the whole a market more or less confusing to the average buyer. Dry White Lead, for example, sells at anywhere from  $4\frac{1}{4}\phi$  to  $5\phi$ , basis price, but when it comes to net result to buyers who take sufficient quantities of the pigment and abide by certain conditions, the real advantage in the lowest gross price is difficult to discover. The line of distinction is hardly as fine in the instance of Lead in Oil, since there are more varieties, but careful buyers can doubtless make as good bargains with the largest producer as with the smaller competitors, particularly where quality may be any object. A net rate above  $5\frac{1}{4}\phi$  for best brands in round lots is not exceptional.

**Red Lead.**—Domestic brands are moving at former prices, but rather slowly, and the demand is hardly up to what might be expected in view of the indifferent manner in which the larger consumers have purchased of late. Prices are still uneven, but show no radical change. Foreign brands are selling slowly at about previous prices.

**Litharge.**—Low grades have been purchased somewhat freely by rubber manufacturers, and a better demand from glass manufacturers is reported, but all orders have been taken care of in a manner that prevented any improvement in prices. Over  $4\frac{3}{4}\phi$  was rarely paid. The high grades have met with slow sale, and prices for the same are still more or less irregular.

**Orange Mineral.**—The market is wholly unchanged. Sellers name former prices for foreign and domestic brands and remark also that sales have been moderate. German brands at about  $7\frac{1}{2}\phi$  seem to have fared the best.

**Zincs.**—There is rather weak undertone to the market for American Oxide, and some indication that at least  $\frac{1}{4}\phi$  concession would be made to buyers of common quality in round lots. Just now there is no market for other than moderate quantities and actual trading basis is difficult to arrive at. Ordinary jobbing quantities are moving at practically old prices. Foreign Zincs are without change in price and sell slowly.

**Paris Green.**—The Associated Manufacturers have agreed upon the following prices and discounts:

|   | Cents<br>per pound. |
|---|---------------------|
| Arsenic, kegs or casks.....                               | 20                  |
| Kegs, 100 to 175 pounds.....                              | $20\frac{1}{2}$     |
| 14-pound, 28-pound, or 58-pound packages, net weight..... | 22                  |
| 2-pound to 5-pound paper boxes.....                       | 22                  |
| 1-pound paper boxes.....                                  | $22\frac{1}{2}$     |
| $\frac{1}{2}$ -pound " ".....                             | $24\frac{1}{2}$     |
| $\frac{1}{4}$ -pound " ".....                             | $26\frac{1}{2}$     |

One to 5 lb tin boxes put up to order at an advance of  $\frac{1}{2}\phi$   $\text{\textcircled{P}}$  lb over paper boxes of similar sizes.

Rebates:  $3\phi$   $\text{\textcircled{P}}$  lb on lots of 10,000 lb or over;  $2\frac{1}{2}\phi$  on 4000 to 10,000 lb;  $2\phi$  on 2000 to 4000 lb;  $1\frac{1}{2}\phi$  on 1000 to 2000 lb;  $1\phi$  on 500 to 1000 lb, purchased during the season. Terms, payable July 1, 1894, with discount at 6% for unexpired time.

**Colors.**—In grinders' Colors there has been hardly the average business. The market, as a matter of fact, is momentarily lifeless, and the little business passing is at former prices. Oil Colors and Mixed Paints have fared nicely in a jobbing way as far as sales are concerned, but prices keep low and the market gains little if anything in tone.

**Oils and Turpentine.**

**Linseed Oil.**—There is a fairly firm output appearance to the market. Some facts come to notice indicating that the market is weaker beneath the surface than above it. Most prominent among these is the fact that out of

town brands of established reputation can be secured at 2¢ per gallon under the list price quoted by the Association city crushers. This combine price is 52¢ for Oil made from American seed. The outsiders offer at 50¢. The latter price is shaded more or less by concerns independent of the city and Western combines, and, upon the whole, affairs are decidedly in a tangle, although some efforts are making to create a different impression. Some Western brands were quoted at as low as 48¢ in carload lots.

**Cotton Seed Oils.**—Slightly firmer tone characterizes the market for Crude Oil, sales having been made at 28¢, while bids of 27¢ were subsequently refused for good sized lots. No large business resulted, however, and the strength of the market is more sentimental than otherwise. In refined there has not been a great deal of business, but limited offering and speculative "bull" movement on a small scale served to carry prices up to 33¢ @ 33½¢ for prime Summer Yellow and correspondingly for other varieties.

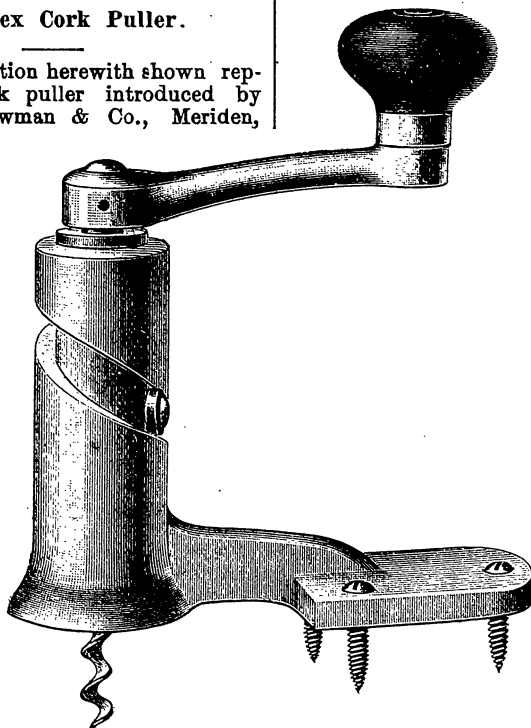
**Lard Oil.**—Prices have moved a shade higher. Prime Oil, local make, realized 65¢, and Western went at within 1¢ of that price. The quantities taken were moderate, however, and the market is at present in a quiet condition, with no sign that other influence than movement in cost of raw material is affecting prices. The low grades are slow of sale and unchanged.

**Fish Oils.**—Apart from a sale of about 300 barrels crude Sperm at 62½¢ little has been done, and the demand for crude products generally is on a very small scale. In the manufactured products there is a fair jobbing movement, chiefly at former prices. The leaning of prices is more or less in buyers' favor.

**Spirits Turpentine.**—A somewhat better business has been done, but the movement of supplies is not above the average, and prices have undergone very little change. During the week prices have not varied much from 30¢ for machine or original barrels.

#### Simplex Cork Puller.

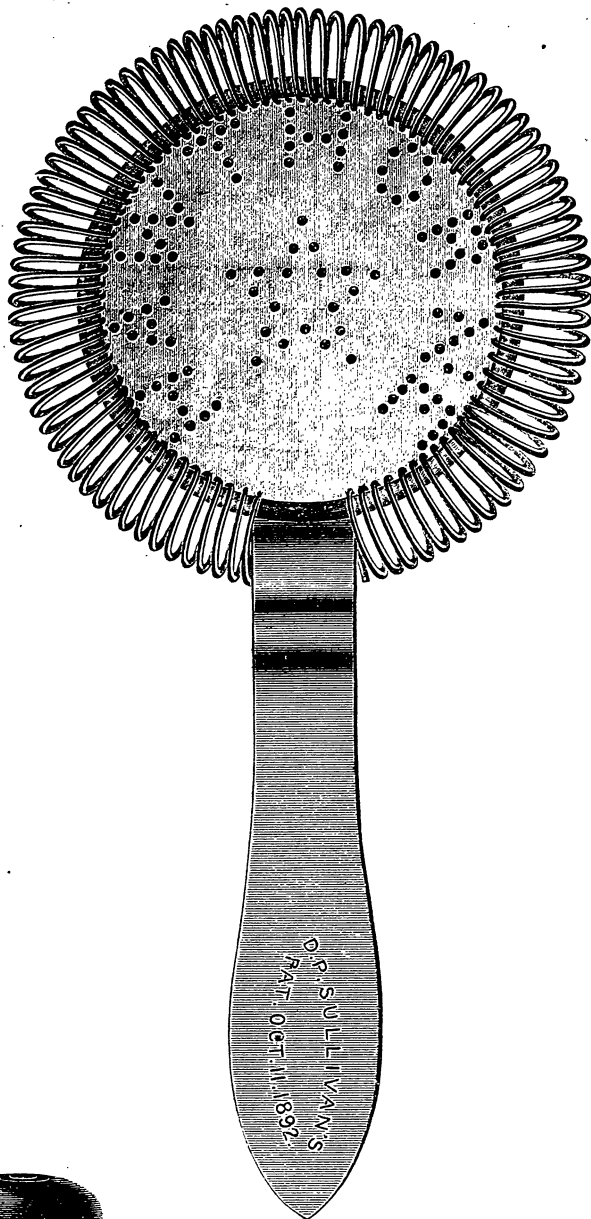
The illustration herewith shown represents a cork puller introduced by Manning, Bowman & Co., Meriden,



Simplex Cork Puller.

Conn., and 57 Beekman street, New York. The construction of the cork puller, which is nickel plated, is shown in the cut, the parts on which the

strain comes are roller bearing to reduce the friction to a minimum. The puller is simple, having no cogs or levers; and it is impossible, it is stated,



Hawthorne Julep Strainer.

to get it out of order. It is claimed that bottles cannot be broken when using the puller, as the cork revolves while it is being drawn. The wire is cut, the cork drawn and thrown off the worm automatically simply by turning the crank. The manufacturers claim that the puller requires little room in which to operate it, as it is smaller than other machines; that it takes one-third the power to operate it, and that it is positively noiseless in operation.

#### Hawthorne Julep Strainer.

Manning, Bowman & Co., Meriden, Conn., and 57 Beekman street, New York, are introducing a strainer as illustrated herewith. It is made of brass, silver plated, the perforations forming the word Hawthorne. The wire coil is of brass, silver plated, and slips under the rim around the body of the strainer. It may be released in a moment, cleansed of any fruit seeds or shreds, and as readily replaced. The handle is shaped so as to fit over a glass and to be held conveniently by the hand. The strainer is designed to instantly fit any glass, as the wire coil when pressed on the glass assumes an upright position, standing nearly the height of the diameter of the coil.

The Stevens Ideal Rifle.

J. Stevens Arms & Tool Company, Chicopee Falls, Mass., are offering an 1894 model rifle, as shown in the accompanying cuts. The arm possesses compactness and portability, the barrels being detachable, permitting packing into a small compass, the detaching and assembling of the arm being accomplished expeditiously without the aid of tools. The arm is described as having a solid frame in one piece with no side plates, having straps running back from the frame, which are let into the wood of the stock, the straps being firmly secured to the stock by screws. The arrangement of the rifle is such that several barrels of different calibers may

as saving much handling, the washer being always with the bolt. The same firm are also introducing the track bolt

to stretch until a strain of about 20,000 pounds is reached, and that the stretch of the bolt before breaking is about  $\frac{1}{4}$

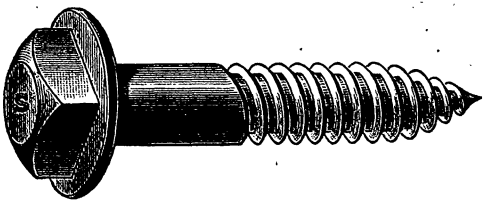


Fig. 1.—Combined Lag Screw and Washer.

shown in Fig. 2. The bolt is made of soft steel, and the threads are raised above the body of the bolt by cold

inch. The bolt can be made with any style thread required. Fig. 3 represents a steel boiler bolt being introduced by

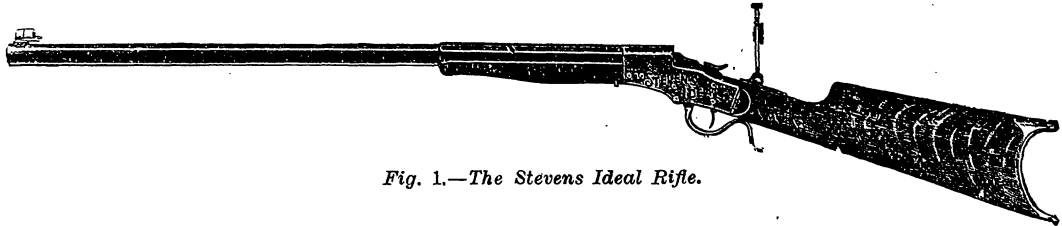


Fig. 1.—The Stevens Ideal Rifle.

be fitted into one action, thus securing several guns in one, greatly reducing the cost, it is explained, to one wishing different calibers and permitting the use of the same gun for different purposes. The arm is made in 22, 25, and 38 calibers, any or all of the barrels to interchange and to be used in one frame. The barrel connects with the stock immediately in front of the frame, as in Fig. 2, the barrels of all calibers, except the 22, being threaded into the frame, but turning easily, it is stated, so as to be taken out or put in with the hands. To load, the lever is thrown down, the cartridge inserted, the action closed by bringing the lever back, the arm cocked and fired. To detach the barrel the lever is thrown down, the screw forward

pressure under a new process. The makers state that the bolt has about 50

the firm. The bolt is intended for use by boiler makers as a "fitting up" bolt,

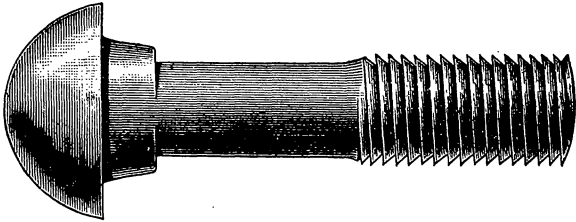


Fig. 2.—Soft Steel Track Bolt with Raised Thread.

percent. greater tensile strength than an iron cut thread bolt of the same size, and is actually stronger in the threaded

and is made of soft steel with very coarse threads, so that the nuts can be run off quickly by hand. The shape of the neck, it is claimed, is another advantage. The bolt is made with a cone point, and fitted with the firm's patent recessed nut, which nut has a recess in its bearing face a little greater in diameter than the bolt, so as to inclose or house the bolt threads and protect them from injury by the chafing of the plates when in service.

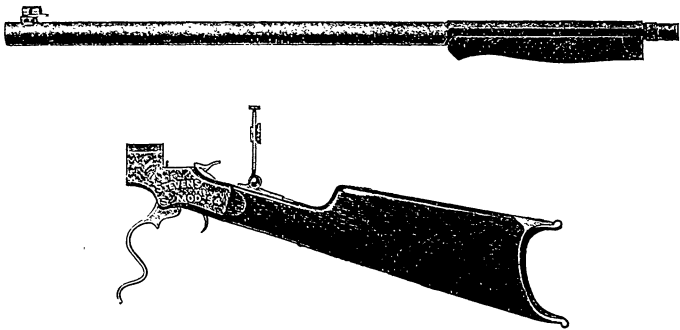


Fig. 2.—Stevens Ideal Rifle Apart.

of the frame loosened and the barrel is then drawn forward through the frame. In Fig. 1 a No. 109 or No. 110 arm assembled is shown, which is made with half octagon barrel, wind gauge front and mid range vernier back sight, varnished fore end and stock, case hardened frame and nickel plated Swiss butt plate.

portion than in the shank, as repeated tensile tests have proved. The thread is so raised or spun up as to make the

R. B. MILLER & Co. have established an agency at Lansing, Mich., for Manufacturers' and Builders' Supplies. Their business will be conducted on a commission basis. They have perfected arrangements for representing the following among other concerns: J. E. Bolles & Co. of Detroit, Mich.; Russell Wheel & Foundry Company of Detroit, Mich.; Dearborn Foundry Company of Chicago, Ill.; S. C. Johnson, Racine, Wis.; Kellogg Iron Works, Buffalo, N. Y.; James A. Miller & Bro., Chicago, Ill.; National Sheet Metal Company, Jersey City, N. J.; Thorn Shingle & Ornament Company, Philadelphia, Pa. But little stock will be carried, the greater part of their work being secured from plans and specifications. A full line of samples will, however, be carried.

Special Screws and Bolts.

In Fig. 1 of the accompanying illustrations is shown a new lag screw which J. H. Sternbergh & Son, Reading, Pa., are putting on the market. The washer is described as being forged on to the lag screw solidly, thus making a lag screw and washer in one piece. It is remarked that this combination will be appreciated by consumers and shippers

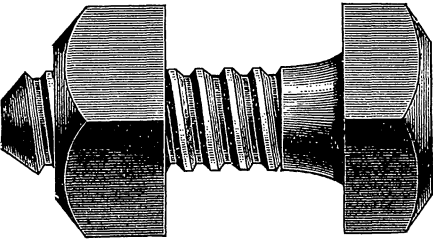


Fig. 3.—Steel Boiler Bolt with Cone Point.

diameter of the threaded portion about  $\frac{1}{8}$  inch greater than the shank. They also state that the bolt will not begin

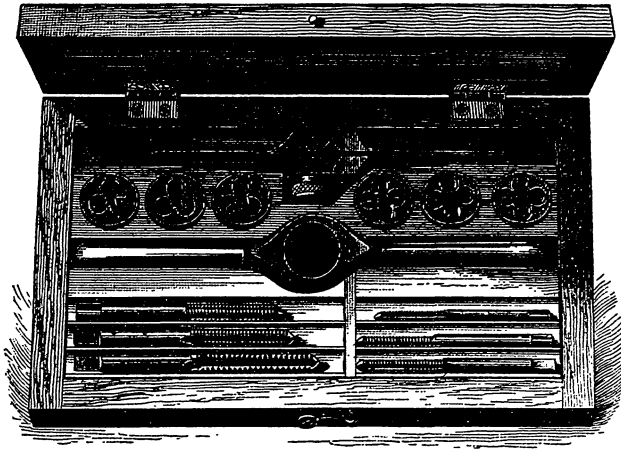
C. L. MUNGER, 142 Lake street, Chicago, has been appointed general sales agent for the Western territory for the W. E. Thayer Mfg. Company, Williamsburg, Mass., who are widely known as manufacturers of Screw Drivers and small Tools. Mr. Munger will carry a stock of these goods at his storerooms, from which orders will be promptly filled.

**Columbian Screw Plate.**

Alfred Ely & Co., Baltimore, Md., are placing on the market the screw plate as shown in the accompanying illustration.

The dies, which are  $\frac{1}{4}$  inch in diameter, are described as being made solid from the finest grade of tool steel, but

to use Nos. 1, 1 $\frac{1}{2}$ , 2, or 2 $\frac{1}{2}$  primers, as desired. The bullets used are of 55 and 48 grains, which may be cast, it is stated, in the molds made by the Ideal Mfg. Company, New Haven, Conn. The point is made that with a charge of from 16 to 20 grains of powder, the 55 and 48 grain bullets, as well as the ordinary 45-grain bullet, may be made to spin well and to give increased



Columbian Screw Plate.

split on one side to allow of adjustment in case of wear, or where over or under sizes are to be cut, the die, it is explained, having enough elasticity to return to original size should it be desired. The die holder is made from steel, case hardened to prevent undue wear, and in its outer edge three screws are set, by means of which the die is held in position and also adjusted as occasion may require. The adjustable tap wrench, which is shown in the cut, is drop forged from tool steel hardened and well finished. One side is split part way and sprung out so that in connection with the two square holes in the center and the small knurled thumb screw all sizes of taps can be quickly and firmly held for use, giving a large bearing surface on the square of the tap end. This set is furnished complete in a hardwood box, with adjustable tap wrench, die holder, taps and dies to cut four, five, six or seven sizes, the range being from  $\frac{1}{16}$  to  $\frac{1}{2}$  inch by  $\frac{3}{4}$  inch, and all machine screw numbers from 1 to 14, in a great variety of threads, the assortment at present consisting of nearly 100 different sizes, which will be added to as the demands warrant. The screw plate is designed for the special use of machinists, tool makers, model makers, bicycle repairers and like trades requiring accurate tools of this description, with a large range.

**Harwood's Hornet Cartridge.**

The accompanying illustration represents a .22-20 central fire cartridge, being put on the market by R. Harwood, Somerville, Mass. The shell is described as made on the same lines as



Harwood's Hornet Cartridge.

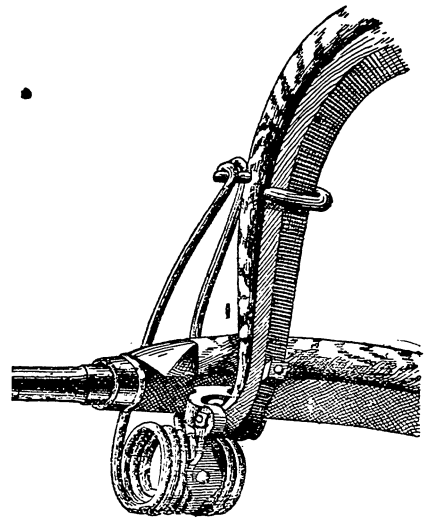
the .25-20 central fire, but drawn down a little at the mouth to take a bullet of smaller caliber. The shell holds about 20 grains of powder, and will be made

rests is made of polished steel, nickel plated, the clamps are of cast brass, nickel plated, and the seat and bearings of oil finished ash, the bottom of the bear-

ings being covered with rubber so as not to deface the bathtub molding. The seats are also made with the metal work enameled, instead of being finished as described. Other styles are made to order with adjustments on the sides to raise or lower the seat, with a tilting seat board made of any kind of wood desired, or of aluminum or rubber. The seats are designed to fit any style of bathtub and for all kinds of bathing. They are referred to as convenient for foot baths, hip, vapor or sitting baths, and as especially adapted to the use of invalids.

**The Star Coil Spring Shaft Support.**

The Decatur Shaft Support Company, Decatur, Ill., are manufacturing the

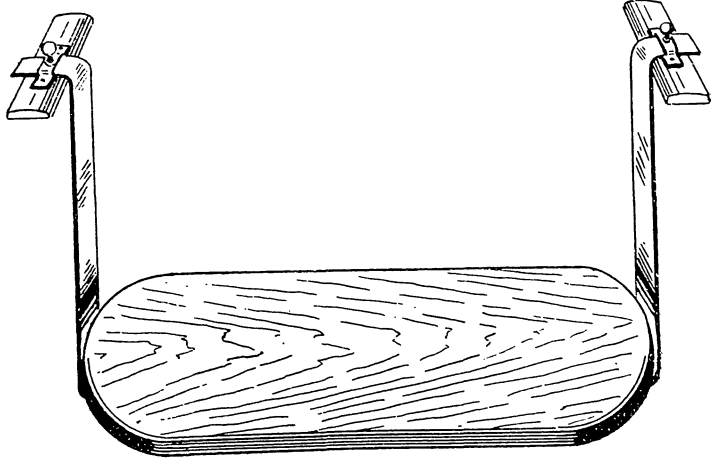


The Star Coil Spring Shaft Support.

device which is herewith illustrated. It consists of a strong coiled spring attached to the under side of the carriage axle and connected above with the

**Adjustable Bathtub Seat.**

St. Louis Bronze & Aluminum Works, 3741-3743 North Broadway,



Adjustable Bathtub Seat.

St. Louis, Mo., are offering an adjustable bathtub seat, as shown herewith. The hanging bar upon which the seat

rests is sufficiently strong to support the weight of the shafts and thus relieve the horse of that much of his burden. In addition to this excellent service it is also an effectual preventive of rattling, and, besides, it saves bracing or propping up the shafts. The point is further made that in case of a runaway and the breaking of the harness the shafts do not drop to the ground and cause a wreck.

The Benbow Mfg. Company, St. Louis, Mo., are sending out a four-page circular describing their Columbian

washer, which is self heating. The jobbing trade are now handling this machine and dealers throughout the country are referred to as also becoming interested. The circular also contains testimonials from those who have used this washer.

### Rapid Acting Vises.

W. C. Toles & Co., 35 to 41 East Indiana street, Chicago, Ill., are introducing wood workers' vises as shown in the accompanying cuts. The vises are constructed of steel and iron, with an operating screw  $1\frac{1}{4}$  inches in diameter, having a groove cut its entire

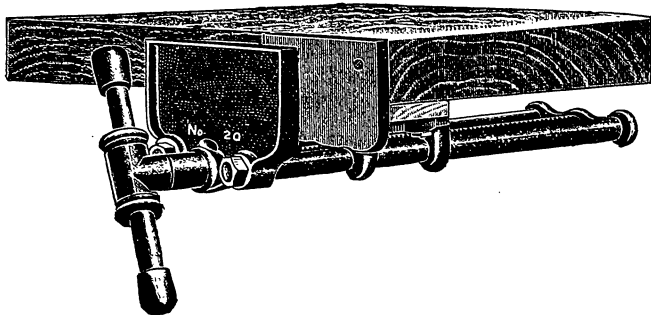


Fig. 1.—Rapid Acting Flush Vise No. 20.

length. This engages with a heavy sectional bronze nut, which, owing to its peculiar construction and operation, allows the threads on the screw, it is stated, to engage at any point, securely clamping the work and as rigidly as in an ordinary vise. When adjusting the jaws to the work in hand, the handle is brought to a stop, which brings the groove on the screw in alignment with the sectional nut and allows the jaws to be opened to 12 inches instantly. The No. 20 shown in Fig. 1 is a flush vise, designed particularly for the use of carpenters and cabinet makers. No. 30, Fig. 2, is a high vise, having a swivel jaw for holding taper or irregular work, and is intended for the use of pattern makers, also for car work, carriage makers' and other lines of wood work. The makers remark that it has been their aim to furnish wood workers with a vise that is as accurate as the rest of their kit of tools. It is claimed that the vises are constructed in the best possible manner; that all working parts are ac-

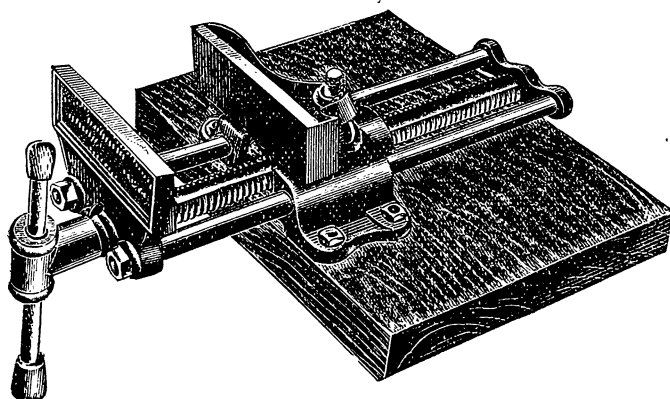


Fig. 2.—Rapid Acting Swivel Vise No. 30.

curately finished; that the jaws are finished perfectly true and will securely clamp a sheet of writing paper; that the jaws require no facing with leather or wood, and that they will not mar the finest quality of wood.

### Tension Bolt Lock Nut Shear.

Henry Seymour Cutlery Company, Holyoke, Mass., are introducing the

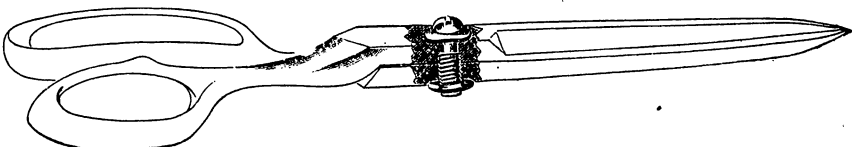


Fig. 1.—Tension Bolt Lock Nut Shear.

shear illustrated in Fig. 1. The shear is constructed with a hollow depression on the top of the blade to receive the

claim that the slackness which is sometimes unavoidable in ordinary shears is hereby entirely obviated, and that the wear under the head of the bolt is taken

up by the automatic action of the regulation spring.

### The Matchless Coffee Pot.

Hill & Whitney Mfg. Company, 149 Pearl street, Boston, are offering a coffee pot as shown herewith. It is made with a filter which can be raised or lowered by means of a chain attached to it,

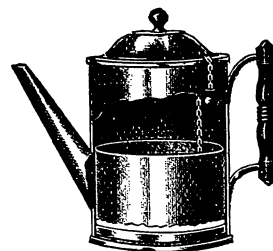


Fig. 1.—The Matchless Coffee Pot.

and which can be removed. For filtering, common unbleached cotton cloth is used, torn or cut in squares about an inch larger than the cylinder bottom, and secured on the bottom of the filter by means of a screw cap. In use the filter is placed at the bottom of the pot as in Fig. 1, into which fine ground coffee is put, and on which is poured the desired quantity of boiling water. After the pot has stood on the stove seven to ten minutes the filter is raised as in Fig. 2, and suspended by catching the hook on the chain over the rim of the pot. As soon as the liquid has passed from

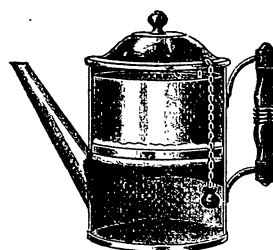


Fig. 2.—Filter in Coffee Pot Raised.

the filter, which requires two or three minutes, the coffee is considered ready for use. The advantages claimed for the process of first steeping and then filtering the coffee are as follows: That the grounds and water are quickly and perfectly combined and remain together steeping as long as is desired; that in the use of a filter practically of as large an area as the pot a close texture of cloth can be used, permitting the use of fine ground coffee, resulting in economy of time and material and the production of a clear extract, and that by daily renewals of the filter at a cost of from  $\frac{1}{4}$  to  $\frac{1}{2}$  cent for each cloth, a uniform and excellent beverage is always obtained, free from all disagreeable taint. The manufacturers state that the pot is also especially adapted to making tea.

steel disk spring represented in Fig. 2 by No. 2. The bolt No. 1, with a screw thread, runs through the disk spring into a threaded hole in the lower

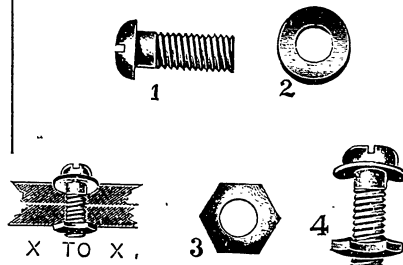


Fig. 2.—Parts of Tension Bolt.

blade, as in  $x$  to  $z$ , and is doubly secured by the six-sided brass lock nut No. 3. The three attachments before being fitted are shown by No. 4. It is explained that in opening and shutting the blades of the shear the spring moves

up and down, but under a strong tension, which always keeps the blades pressed against each other and avoids the loose, shakly motion of the blades caused by the wearing out of the screw under the head. The manufacturers



# Current Hardware Prices.

APRIL 25, 1894.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

## Adjusters, Blind—

Domestic.....\$ doz \$3.00, 33%&39%&10%  
Excelsior.....\$ doz \$10.00.....50&10&2%  
North's.....\$ doz \$10.00.....50&10&2%  
Zimmerman's—See Fasteners Blind.

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anvils—

### American—

Eagle Anvils, \$ 2 doz.....15&15&5%  
Horse shoe brand, Wrought.....11&11%  
Moore & Barnes Mfg. Co.....33%&39%

### Imported—

Armstrong Mouse Hole.....10&10%  
S. & H. machine finished.....10%&11%  
Trenton.....10&10%  
Wilkinson's.....10%&11%  
Peter Wright's.....11&11%

## Anvil Vise and Drill—

Allen Anvil and Vise \$3.00.....40&10%  
Onesey Anvil and Vise.....25%  
Millers Falls Co., \$18.00.....45&5%  
Star.....45&5%

## Apple Parers—See Parers Apple, &c.

## Augers and Bits—

Boring Machine Augers.....70&70&10%  
Car Bits, 12-in. twist.....50%  
Common Augers and Bits.....70&70&10%  
Cincinnati Bell-Hangers' Bits.....30&10%  
Forster Pat. Auger Bits.....15%  
Jennings' Pattern Car Bits.....45%  
Jennings' Pattern Auger Bits.....50%  
O. E. Jennings & Co., No. 10, extension  
lip.....40%  
O. E. Jennings & Co., No. 30.....60%  
O. E. Jennings & Co., Auger Bits, 7 set  
32% quaters, No. 5, \$5; No. 30, \$35.50.25%  
Russell Jennings' Augers and Bits.25&10%  
Lewy's Patent Singletwist.....45%  
L'Hommedieu Car Bits.....15&10%  
Pugh's Black.....20%  
Pugh's Jennings Pattern.....30%  
Snell's Bits.....60&5&60&10%

## Bit Stock Drills—

Cleveland.....50&10&5%  
Cincinnati, for wood.....30&10%  
Cincinnati, for metal.....30&10%  
Morse Twist Drills.....50&10&5%  
New Process Twist Drill Co.....50&10&5%  
Standard.....50&10&5%  
Syracuse, for metal.....50&10%  
Syracuse, for wood (wood list).30&30&5%

## Expansive Bits—

Clark's small, \$18; large, \$28.35&35&10%  
Ives' No. 4, \$ doz \$80.....40%  
Steer's, No. 1, \$28; No. 2, \$18.....35&40%  
Stearns' No. 2, \$48.....20%  
Swan's.....40%

## Gimlet Bits—

Bee.....25&25&5%  
Common.....\$ doz \$2.75&3&25%  
Diamond.....\$ doz \$1.25.....40&10%  
Double Cut.....30&10%  
Ct. Valley Mfg. Co.....30&10%  
Hartwell's.....\$ gr. \$10.00.....40&10%  
Douglass.....40&10%  
Ives.....60&60&10%  
Shepardson's.....45&45&10%

## Hollow Augers—

Bonney's Adjustable, \$ doz \$48.....50%  
Cincinnati Adjustable.....25&10%  
Cincinnati Standard.....25&10%  
Douglass.....33%&33%&10%  
French, Swift & Co. (Beecher).....30%&33%&10%  
Ives' Expansive, each \$4.50.....50&5%  
Stearns.....20&10%  
Universal Expansive, each \$4.50.....20%  
Wood's.....25&25&10%

## Ship Augers and Bits—

L'Hommedieu's.....15&10&15&10&5%  
Snell's.....25&25&10%  
Snell's Ship Auger Pat'n Car Bits.....15&10&15&10&5%  
Watrous's.....25&25&10%

## Awl Hafts—See Hafts, Awl.

## Awls—

Brad, Handled.....\$ gr. \$2.50&\$3.00  
Brad, Shouldered.....\$ gr. \$1.30&\$1.40  
Peg, Pat.....\$ gr. \$1.50&\$1.65  
Peg, Should.....\$ gr. \$1.50&\$1.65  
Scratch, Handled.....\$ gr. \$4.00&\$4.20  
Scratch, Socket.....\$ doz \$1.10&\$1.20

## Awl and Tool Sets—See Sets, Awl and Tool.

## Axes—

First quality, best brands.....\$6.00&\$6.50  
First quality, other brands.....5.00&6.00  
Beveled add 50¢ @ doz.

## Axe Grease—See Grease, Axle.

## Axles—

No. 1.....3%&4%  
No. 1 to 14.....70%  
No. 15 to 28.....47%  
No. 19 to 22.....70%  
Concord Axles, loose collar.....3% cash  
Concord Axles, solid collar.....4%&5%  
Wagon

## Bag Holders—See Holders, Bag.

## Balances—

### Sash—

Caldwell, low list.....30%  
Pulman.....60%

### Spring—

Spring Balances.....40&40&10%  
No. 2000 20 80  
Chatillon, \$ doz.....\$0.80 0.95 1.75 net  
Chatillon Straight Balances.....40&40&10%  
Chatillon Circular Balances.....60&10%

## Barb Wire—See Wire, Barb.

## Bars—

### Crow—

Cast Steel.....\$ 3 3/4&3 3/4%  
Iron, Steel Points.....\$ 2 3/4&2 3/4%

## Basins, Wash—

Standard Fiberglass, No. 1, 10% in. \$1.80;  
12-inch, \$2.00; 13 1/4-inch, \$2.50; 15-inch,  
\$3.00.

## Beams, Scale—

Scale Beams, List Jan. 12, '82.....60&10%  
60&10&5%  
Chatillon's No. 1.....50&10&50&10&5%  
Custer's.....33%&39%

## Beaters—

### Egg—

Bryant's.....\$ gross \$14.00  
Double (H. & R. Mfg. Co.) \$ gr. No. 0  
\$12.00; No. 1, \$15.00; No. 2.....\$36.00  
Dover.....\$ doz \$1.00&\$1.20  
Dover (Standard Co.).....\$ doz \$1.00  
Duplex (Standard Co.).....\$ doz \$1.00  
Duplex Extra Heavy (Standard Co.).....\$ doz \$3.50  
Easy (H. & R. Mfg. Co.).....\$ gr. \$12.00  
Improved Acme (H. & R. Mfg. Co.).....\$ gr. \$9.00  
Silver & Co.....\$ doz \$5.50  
Spiral.....\$ gr. \$4.25&\$4.50  
Triple (H. & R. Mfg. Co.).....\$ gr. \$16.50

### Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;  
No. 2, \$2.....20%

## Bells—

### Cow—

Common Wrought.....60&10%  
Kentucky Durham.....70&10%  
Kentucky, Sargent's list.....70&10%  
Kentucky, "Star".....20&10%  
Texas Star.....50&10&50&10&5%  
Western, Sargent's list.....70&10%

### Door—

Crank, Brooks'.....50&10&2%  
Crank, Cone's.....10%  
Crank, Cone's.....20&10%  
Gong, Abbe's.....30&10%  
Gong, Barton's.....40&10&50%  
Gong, Yankee.....45&10%  
Lever, R. & E. Mfg. Co.'s.....50&10&2%  
Lever, Sargent's.....60&10%  
Lever, Taylor's Bronzed or Plated.....net  
Lever, Taylor's Japanned.....25&10%  
Full, Brooks'.....60&10&2%

### Electric—

Bigelow & Dowse.....20&20&10%  
Wollensak's.....20&20&10%

### Hand—

Extra Heavy Brass.....70%  
Light Brass.....70&10&70&10&5%  
Silver Chime.....33%&39%  
White.....70%  
Globe Cone's Patent.....25&10&35%

## Miscellaneous—

Call.....45&50%  
Farm Bells.....\$ 3 3/4&3 3/4%  
Steel Alloy Church and School Bells.....40%

## Bellows—

Blacksmiths'.....60&10&5&60&10&10%  
Hand Bellows.....40&10&50%  
Molders'.....40&10&50%

## Belting, Rubber—

Common Standard.....75&10&75&10&5%  
Extra.....60&10&5&70%  
Standard.....70&10&75%  
N.Y.B. & P. Co., Carbon.....60&10&5%  
N.Y.B. & P. Co., Double Diamond.....60%  
N.Y.B. & P. Co., 1846 Para.....40&10%

## Bench Stops—See Stops, Bench.

## Benders and Upsetters,

### Tire—

Detroit Perfected Tire Bender.....15%  
Green River Tire Benders and Upsetters.....20%  
Stoddard's Lightning Tire Upsetters.....15%

## Bits—

Auger, Gimlet, Bit Stock Drills, &c.,  
see Augers and Bits.

## Bit Holders—See Holders.

## Blind Adjusters—See Adjusters, Blind.

## Blind Fasteners—See Fasteners, Blind.

## Blind Staples—See Staples, Blind.

## Blocks—

Cleveland Block Co., Mal. Iron.50&10&60%  
Moreau Novelty, Mal. Iron.....50%  
Sure Grip Steel Tackle Block.....25%  
See also Machines, Hoisting.

## Bolts—

### Carriage, Machine, &c.—

Com. list June 10, '84.....80&10&50&10&5%  
Genuine Eagle, Norway, list Oct. '84.....80&5&80&10%  
Eagle, Norway, list Oct. '84.....80&10&50&10&5%  
Phila. pattern, list Oct. 7, '84.....80%  
R.B. & W., old list.....70%  
Bolt Ends, list Jan. 1, 1890.80&10&80&20%  
Machine, list Jan. 1, 1890.30&10&80&20%

### Door and Shutter—

Cast Iron Barrel, Square, &c.....75&10%  
Cast Iron Chain (Sargent's list).....65&10&65&10&5%  
Cast Iron Shutter Bolts.....75&10%  
Ives' Patent Door Bolts.60&10&60&10&10%  
Wrought Barrel.....75&75&5%  
Wrt B. K. Flush, Common.....55&10%  
Wrt Shutter, Brass Knob.50&10&50&10&5%  
Wrt Shutter, Sargent's list.....60&10%  
Wrt Shutter, all Iron, Stanley's.....60&10&60&10&10%

### Wrought Square—

Wrt Sunk Flush, Sargent's list.....60&10%  
Wrt Sunk Flush, Stanley's list.50&10&10%

### Stove and Plow—

Plow.....60&10&60&10&10%  
Stove.....65&70%  
R. B. & W., Plow.....50%

## Tire—

Common, list Feb. 28, '83.....70&70&10%  
American Screw Company.....75%  
Norway, Phila. list Oct. 16, '84.....75%  
Eagle, Phila., list Oct. 16, '84.....80%  
Bay State, list Feb. 28, '83.....70%  
Port Chester Bolt and Nut Company:  
Empire list Feb. 28, '83.....70%  
Keystone, Philadel., list Oct. '84.....80%  
Norway, Phila., list Oct. '84.....75%  
R. B. & W., Philadel., list Oct. 16, '84.....80%

## Borers, Tap—

Common and Ring.....20&10%  
Clark's.....33%&39%  
Enterprise Mfg. Co.....25%  
Ives' Tap Borers.....33%&39%

## Boring Machines—See Machines, Boring.

## Bow Pins—See Pins, Bow.

## Boxes, Letter—

Tatum's.....40%

## Boxes, Wagon—

Per lb.....2%&2%

## Boxes, Miter.

Spiker's Excelsior, 3 in. \$7.50, 4 in.  
\$8.50, 5 in. \$13.00, 6 in. \$15.00.....20%

## Braces—

American Bit Brace and Tool Co.:  
Nos. 10, 12, 20.....60&10%  
Nos. 11, 21, 24, 27.....70&10%  
Nos. 22, 23, 25.....60&10&5%  
Nos. 13, 26, 36, 37.....70&10&5%  
Amidon's:  
Barker's Imp'd Plain.....75&10&80%  
Barker's Imp. Nickeled.....65&10&70%  
Ratchet.....75&10&80%  
Eclipse Ratchet.....60%  
Globe Jawed.....40&40&10%  
Corner Brace.....40&40&10%  
Universal, 8 in., \$2.10; 10 in.....\$2.25  
Buffalo Ball.....\$1.10&\$1.15  
Barker's.....50&10%

## Brackets—

Shelf, fancy.....70&70&10%  
Sargent's list.....65&70%  
Shelf, plain.....60&10&70&10%  
Bradley Shelf Brackets.....70&10%  
Bright Wire Goods—See Wire.  
Brothers:  
Henis Self-1 inch.....9 10 9x11  
Basting.....\$ doz \$4.50 5.50 6.50  
Ming's doless.....\$ doz \$12.50  
New Haven.....50%  
Queen City.....33%  
Wire Goods Co.....45&10%

## Buckets, Well and Fire—

See Pails, Galvanized.

## Bull Rings—See Rings, Bull.

## Butcher's Cleavers—See Cleavers, Butcher's.

## Butts—

Cast Brass, Fast.....33%&10%  
Cast Brass, Loose Joint.....33%&10%  
Cast Brass, Tiebout's.....50%  
Wrought Brass.....80&10&80&20%

## Cast Iron—

Fast Joint, Broad.....60&60&5%  
Fast Joint, Narrow.....60&60&5%

## Loose Joint.....

Loose Joint, Japanned.....75&10  
Loose Joint, Jap. with Acorns.....@30%  
Loose Pin, Acorns.....  
Loose Pin, Acorns, Japanned.....  
Loose Pin, Acorns, Japanned,  
Plated Tips.....  
Mayer's Hinges.....  
Parliament Butts.....

## Wrought Steel—

Fast Joint, Broad.....  
Fast Joint, Narrow.....  
Inside Blind, Light.....  
Inside Blind, Regular.....  
Loose Joint, Broad.....  
Loose Pin.....  
Table Butts, Back Flaps, &c.....  
Bronzed Wrought Butts.50&10&50&10&10

## Cages, Bird—

Hendryx, Brass.....10&50%  
Hendryx, Enameled.....40&10&50%

## Callipers—See Compasses.

## Calks, Toe—

Burke's, One Prong, Blunt.....4%&5%  
Burke's, One Prong, Sharp.....5%&6%  
Burke's, Two Prong, Blunt.....5%&6%  
Burke's, Two Prong, Sharp.....5%&6%  
Gautier, One Prong, Blunt.....5%&6%

## Can Openers—See Openers, Can.

## Cans Milk—

S. S. & Co.: 5-gal., \$3.00; 8-gal., \$4.40;  
10-gal., \$4.75 each.....40&10

## Cans Oil—

Galvanized Blue Band, 1 gal., \$ doz. \$2.35  
Galvanized Blue Band, 5 gal., Tip Top,  
\$ doz. \$12.00  
Galvanized Blue Band, 5 gal., Faucet,  
\$ doz. \$8.00  
Glass Oil, Friend.....\$ doz. \$2.75

## Caps—

### Percussion—

Hicks & Goldmark's and Union Metallic  
Cartridge Co.....\$ 1000  
Eley's E. B.....56&50%  
Eley's D. Waterproof, Central Fire.....\$1.60  
E. B. Grnd. Edge, Cent. Fire, 1-10's.....47&50%  
E. B. Trimmed Edge, 1-10's.....47&50%  
F. L. Waterproof, 1-10's.....35&37%  
G. D.....27&30%  
Musket, Waterproof, 1-10's.....50&53%  
S. B. Genuine Imported.....45%

### Primers—

Berdan Primers, \$1.00.....2%  
B. L. Caps (Sturtevant Shells) \$1.00.....2%  
All other Primers, \$1.20.....2%

## Cards—

Watson's Cotton, Wool, Horse and  
Fib, list January 28, 1891.....25%

## Carpet Stretchers—

See Stretchers, Carpet.

## Cartridge Balls, Swgd.—

B. B. Caps, Round Ball, Swgd., \$1.35&\$1.90  
B. B. Caps, Round Ball, \$1.60&\$1.65  
Blank Cartridges, except 22 and 32 cal.,  
additional 10% to above discounts.  
Blank Cartridges, 22 cal. \$1.75.....2%  
Blank Cartridges, 32 cal. \$1.50.....2%  
Cent. Fire, Military and Sporting.....15&5&2%  
Cent. Fire, Pistol and Rifle.....25&5&2%  
Primed Shells and Bullets.....15&5&2%  
Rim Fire Cartridges.....60&5&2%  
Rim Fire Military.....15&2%

## Carpet Sweepers—

See Sweepers, Carpet.

## Casters—

Bed.....Brass.....55&55&10%  
Flat.....Others.....60&60&10%  
Shallow Socket.....40&10%  
Deep Socket.....40&10%  
Giant Truck Casters.....35%  
Gwinner's Common Sense.....45%  
Gwinner's Hercules.....45%  
Martin's Patent (Phoenix) 45&10&60&10%  
Payson's Anti-friction.....70&70&10%  
Payson's Truck.....60&60&10%  
Socket Truck Casters.....50&50&10%  
Stationary Truck Casters.....50&10%  
Tucker's Patent, low list.....45%  
Yale Casters, low list.....45%  
Yale, Gem.....70%

## Cattle Leaders—

See Leaders, Cattle.

## Cement—

Victor Elastic.....5 lb pails \$ 2

## Chain—

American Coll. in cast lots,  
5-16 5-16 7-16 5-4 5-4  
\$7.60 5.30 4.45 3.30 3.65 3.50 3.40 3.25  
Less than cast lots, add 1/4¢ @ 1/4¢  
German Coll. list July 12, 1892.....60&5&60&10%

German Halter Chain, list July 12, 1892.....60&5&60&10%

Trace, Wagon and Fancy Chains.....10%  
List revised May, 1893.....60&60&10%  
Barnes' Reinforced Sash.....60&11%  
Barnes' Victor Sash.....65%  
Covert Halter.....60&2%  
Covert Heel Chain.....50&2%  
Covert Traces.....55&2%  
Jack Chain, Iron and Brass, list July  
10, 1893.....60&10%  
Oneda Halter Chain.....60&60&5%  
Pump Chain, Galvanized.....\$ 100 lb \$5.50  
5-ton lots.....\$ 100 lb \$5.75  
500-ton lots.....\$ 100 lb \$5.75

**Checks, Door—**.....50%

**Chisels—**

**Socket Framing and Firmer**

**Mix**

Ohio Tool Co. .... 75&10&80%

P. S. & W. .... 30%

Witherby ..... 30%

Buck Bros. .... 30%

Charles Buck ..... 30%

Douglas ..... 75&10&80%

Merrill ..... 80&100&60&10&5%

L. & I. J. White ..... 30&30&25%

**Tanged and Miscellaneous**

Buck Bros. .... 30%

Charles Buck ..... 30%

Rutgers ..... 30%

Spears & Jacksons ..... 50&50&10%

Tanged Firmers ..... 50&50&10%

Cold Chisels, fair quality, # D ..... 14&16%

**Chucks—**

Beach Pat. .... each, \$8.00 ..... 20%

Danbury ..... each, \$8.00, 30&30&35%

Graham Patent ..... 30&35%

Morse's Adjustable, each, \$7.00, 20&20&25%

Syracuse, Hals Pat. .... 25%

Skinner Patent Chucks, ..... 40%

Combination Lathe Chucks ..... 25%

Drill Chucks ..... 25%

Independent Lathe Chucks ..... 40%

Planer Chucks ..... 20%

Universal Lathe Chucks ..... 40%

Union Mfg. Co. .... 40%

Combination ..... 40%

Independent ..... 40%

Universal ..... 40%

Victor ..... 38.50, 25%

**Churns—**

McDermaid Star Barrel Churn, each 6 gal., \$2.60; 10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25

Tiffin Union, each 6 gal., \$3.25; 7 gal., \$3.75; 10 gal., \$4.25

**Clamps—**

Adjustable, Cincinnati ..... 15&10%

Adjustable, Hammers ..... 15&15&5%

Adjustable, Stearns' ..... 30&30&10%

Barnes' Machinists' Clamps ..... 33%

Cabinet, Sargent's ..... 70&10%

Carpenter's, Cincinnati ..... 25&10%

Carriage Makers', P. S. & W. Co. .... 40&10%

Carriage Makers', Sargent's ..... 75&75&5%

Eberhard Mfg. Co. .... 40&40&10%

Joiners' Clamps, Tatum's ..... 25&10%

R. L. Tool Co.'s Wrought Iron ..... 25%

Saw Clamps, see Vises, Saw Filers'

Stearns' Malleable, with Wrought Iron ..... 40&10&40&10&5%

Warner's ..... 40&10&40&10&5%

**Cleavers, Butchers'—**

Beatty's ..... 40&40&5%

Bradley's ..... 25&30%

Foster Bros. .... 30%

New Haven Edge Tool Co.'s ..... 40%

Nichols ..... 30%

P. S. & W. .... 35&40&35&10%

Schulte, Lohr & Co. .... 40&40&5%

L. & I. J. White ..... 20&25%

**Clips—**

Baker Axle Clips ..... 25%

Norway, Axle, & 5-16 ..... 55&25&5%

Norway Spring Bar Clips, 5-16 ..... 80&25&5%

2d grade Norway Axle & 5-16 ..... 65&25%

Steel Felloe Clips ..... 40&40%

Superior Axle ..... 40&40%

Wrought Iron Felloe Clips ..... 40&40%

**Cloth and Netting, Wire—**

See Wire, &c.

**Cocks, Brass—**

Hardware list (Globe, Kerosene, Lever Bibbs, Racking, &c.) ..... 60&20&60&10%

**Coffee Mills—** See Mills, Coffee.

**Collars, Dog—**

Brass, Pope & Stevens' list ..... 40%

Chapman Mfg. Company, new list ..... 40%

Embossed, Gilt, Pope & Stevens' list ..... 30&10%

Leather, Pope & Stevens' list ..... 40%

Medford Fancy Goods Co. .... 40&10&50%

**Combs, Curry—**

American Curry Comb Co. .... 33&40%

Fitch's ..... 50&10&50&10&10%

Gibb's Magnetic ..... 40%

Kohler's Humane ..... 40%

Kohler's Magic Oscillating ..... 40%

Rubber, per doz ..... 10.00

**Compasses, Dividers &c.**

Compasses, Calipers, Dividers, 70&10&75%

Bemis & Call Co.'s

Dividers ..... 65%

Calipers, Call's Patent Inside ..... 55%

Calipers, Double ..... 65%

Calipers, Inside or Outside ..... 65%

Calipers, Wing ..... 65%

Compasses ..... 50&55%

Excelsior ..... 50%

Starrett's

Combination Dividers ..... 25%

Lock Calipers and Dividers ..... 25%

Spring Calipers and Dividers ..... 25&10%

Stevens & Co.'s ..... 25&10%

**Colors, Water—**

S. S. & Co. 2-gal., \$2.00; 3-gal., \$2.50; 4-gal., \$2.75; 6-gal., \$3.40 each ..... 33&4%

**Coopers' Tools—**

See Tools, Coopers'.

**Cord—Sash—**

Braided, Crown Drab and Fancy, # D, 55¢ ..... 30%

Braided, Crown White, # D, 50¢ ..... 50%

Cable Laid Italian Sash, # D, 19¢ ..... 20%

Common ..... # D, 12¢ ..... 13%

Egyptian, India Hemp, Braided ..... 25%

India Cable Laid Sash, # D, 11¢ ..... 12%

Massachusetts, White ..... 20¢ ..... 24%

Ossawaun Mills—

Braided, Giant, Drab and Fancy, # D, 35¢ ..... 10%

Braided, Giant, White, # D, 30¢ ..... 20%

Patent, good quality ..... # D, 10¢ ..... 11%

Patent Russia Sash ..... # D, 13¢ ..... 14%

Samson—

Braided, Drab Cotton ..... # D, 42¢ ..... 40%

Braided, Italian Hemp ..... # D, 40¢ ..... 40%

Braided, Lumen ..... # D, 37¢ ..... 37%

Braided, White ..... # D, 37¢ ..... 37%

Semper Idem, Braided, White ..... 28¢

Silver Lake—

A quality, Drab, 55¢ ..... 25%

A quality, White, 50¢ ..... 25%

B quality, Drab, 35¢ ..... 10%

B quality, White, 30¢ ..... 10%

Sylvan Spring, Extra Braided, White, 34¢

Sylvan Spring, Extra Braided, White, 34¢

Tate's Solid Braided—

Economy, Drab ..... # D, 27¢ ..... 27%

Economy, White ..... # D, 22¢ ..... 22%

Hercules, Drab ..... # D, 30¢ ..... 30%

Hercules, White ..... # D, 25¢ ..... 25%

**White Cotton Braided, fair** # D, 23¢ ..... 24%

**Wire Picture—**

Braided or Twisted ..... 80&25&80&15%

**Corkscrews—** See Screws, Cork.

**Corn Knives and Cutters—**

See Knives, Corn.

**Crackers, Nut—**

Acme

Japanned, # gro., \$30 ..... 50%

Nickel Plated, # gro., \$30 ..... 10%

Blake's Pattern, # doz., \$2.00 ..... 10%

Table (H. & B. Mfg. Co.) ..... 40%

Turner & Seymour Mfg. Co. .... 50%

**Cradles—**

Grain ..... 50&2&50&5&2%

**Crayons—**

White Crayons, # gross ..... 7&8%

D. M. Steward Mfg. Co. .... 25%

Metal Workers', # gross, \$2.50 ..... 25%

Railroad, # gross, 2.00 ..... 25%

Rolling Mill, # gross, 2.50 ..... 25%

Soapstone Pencils, # gross, 1.50 ..... 25%

See also Chalk.

**Creamery Pails—** See Pails, Creamery.

**Crow Bars—** See Bars, Crow.

**Curry Combs—**

See Combs, Curry.

**Cutters—**

**Meat—**

American ..... 30%

Nos. 1 2 3 4 5 6

Each ..... \$5 \$7 \$10 \$25 \$50 \$25

Enterprise ..... 12 22 32 42

Nos. 1 2 3 4 5 6

Each ..... \$3 \$2.50 \$4 \$8 \$15 \$25

Dixon's, # doz. .... 40&40&5%

Nos. 1 2 3 4 5 6

Each ..... \$14.00 \$17.00 \$19.00 \$30.00

Draw Cut, each:

Nos. 5 6 8

Each ..... \$50 \$75 \$80 \$225 ..... 20&25%

Hale's, # doz. .... 70%

Nos. 11 12 13

Each ..... \$27.00 \$35.00 \$45.00

Home No. 1, # doz. .... 55&10%

Little Giant, # doz. .... 40&10&50%

Nos. 305 310 312 320 322

Each ..... \$5.00 \$4.00 \$4.00 \$7.00 \$8.00

Miles Challenge, # doz. .... 45&45&10%

Nos. 1 2 3

Each ..... \$22.00 \$30.00 \$40.00

Triumph No. 505, # doz. .... 25&30%

Woodruff's, # doz. .... 40&40&5%

Nos. 1 2 3

Each ..... \$10.00 \$15.00 \$18.00

Chadborn's Smoked Beef Cutter, # doz. .... 66&00

Enterprise Beef Shavers ..... 20%

**Slaw and Kraut—**

Tucker & Dorsey Mfg. Co. .... 40%

Kraut Cutters ..... 40%

Slaw Cutters, 1 Knife, # gross ..... \$21.00

Slaw Cutters, 2 Knives, # gross ..... 30.00

**Tobacco—**

Acme ..... 40%

All Iron ..... 40%

Champion ..... 40%

Nashua Lock Co.'s, # doz. .... 18.00, 50&55%

National ..... 40%

Sargent's ..... 40%

Wilson's ..... 55%

**Washer—**

Appleton's ..... 40%

Bonney's ..... 40%

Cincinnati ..... 40%

Johnson's ..... 40%

Penny's, # doz., Pol. \$14; Jap'd, \$16, 55%

Smith's Pat. .... 40%

**Diggers, Post Hole, &c.—**

Cronk's Post Bars, # doz. .... 80.00

Eureka Diggers, # doz. .... \$11.00, 12.50

Fletcher Post Hole Augers, # doz. .... 36.00

Gem, Improved, # doz. .... \$9.00, 10.00 net

Gibbs' Columbia ..... 40%

Gibbs' Hustler ..... 40%

Gibbs' Imperial ..... 40%

Gibbs' National ..... 40%

Gibbs' Post Hole Digger ..... 40%

Kohler's Hercules ..... 40%

Kohler's Invincible ..... 40%

Kohler's Little Giant ..... 40%

Kohler's New Champion ..... 40%

Ryan's, # doz. .... \$20.00, 10.00

Schneider, # doz. .... \$34.00, 25&25&10%

Shimer's Hollow Handle, # doz. .... 24.00, 50%

Vaughan's Post Hole Auger, # doz. .... \$8.50, 9.50

**Dividers—** See Compasses.

**Dog Collars—** See Collars, Dog.

**Door Checks—**

See Checks, Door.

**Door Springs—**

See Springs, Door.

**Drawers, Money—**

Money Drawers, # doz. .... \$12&20

Waddell's Improved, No. 1, # doz. .... \$15.00

Waddell's Improved, No. 2, # doz. .... \$18.00

Waddell's Comb. Cutlery Case and Alarm Tilt ..... \$12.50

**Drawing Knives—**

See Knives, Drawing.

**Drills and Drill Stocks—**

Bench Drills, Stearns' ..... 50%

Blacksmiths' ..... each \$1.75

Blacksmiths' Self-Feeding, each \$7.50, 20%

Automatic Boring Tools ..... \$7.50, 85%

Breast, Bartholomew's ..... each \$2.50, 40&40%

Breast, Millers Falls ..... each \$3.00, 25%

Breast, P. S. & W. .... 40&10%

Breast, Wilson's ..... 30&25%

Chicopee Automatic Drill ..... 40&10%

Goodell Automatic Drills, 40&5&40&10%

Ratchet, Curtis & Curtis ..... 25%

Ratchet, Ingersoll's ..... 25%

Ratchet, Merrill's ..... 20&20&5%

Ratchet, Moore's Triple Action ..... 25&30%

Ratchet, Parker's ..... 20&20&5%

Ratchet, Weston's ..... 20&25%

Ratchet, Whitney's ..... 20&10%

Whitney's Hand Drill, Plain, \$11.00, Adjustable, \$12.00 ..... 20&10%

**Twist Drills—**

Cleveland ..... 50&10&10%

Diamond, W. & B. .... 50&10&10%

Graham's Pat. Groove Shank, 50&10&10%

Morse ..... 50&10&10%

New Process ..... 50&10&10%

Standard ..... 50&10&10%

Syracuse (Metal List) ..... 50&10%

**Drill Bits or Bit Stock**

**Drills—** See Augers and Bits.

**Drill Chucks—** See Chucks.

**Dripping Pans—**

See Pans, Dripping.

**Drivers, Screw—**

Allard's Spiral, new list ..... 25%

Brace Screw Drivers ..... 25&10%

Buck Bros. .... 30%

Buck Bros.' Screw Driver Bits ..... 27&25%

Clark's Pat. .... 38&40%

Cincinnati ..... 25&10%

Champion ..... 25&10%

Disston's ..... 50%

Douglas Mfg. Co. .... 50&20&10%

Ellich's Socket and Ratchet, 25&25&10%

Fray's Hol. H. die Sets, No. 3, \$12.00, 45%

Gay & Parsons ..... 35%

Goodell's Automatic ..... 50&50&5%

Knapp & Cowles

No. 1 ..... 70&10%

No. 2 ..... 70&10%

No. 3 ..... 60&10%

Nos. 4 and 60, Acme and Ideal, 60&10%

Kolb's Common Sense, # doz., \$6.00 ..... 25&10%

Mayhew's Black Handle ..... 50%

Mayhew's Monarch ..... 45&10%

P. S. & W. Co. .... 70%

Sargent & Co.

No. 1, Forged Blade ..... 60&10&10%

Nos. 20, 40 and 60 ..... 60&10&10%

Screw Driver Bits, Parr's, # gross, \$6.25

Screw Driver Bits, Stanley R. & L. Co.'s

No. 64, Varinised Handles ..... 65&10%

No. 64, Varinised Handles ..... 70&10%

Stearns ..... 25&10&5%

Syracuse Screw Driver Bits, 30&30&5%

C. T. Williamson Wire Novelty Co. .... 50%

**Egg Beaters—** See Beaters, Egg.

**Egg Poachers—**

See Poachers, Egg.

**Electric Bell Sets—**

See Bells, Electric.

**Emery—** No. 4 to No. 54 to Flour, CF

46 gr. 150 gr. F.F.F.

Kegs, # D ..... 40%

14 kegs, # D ..... 40%

14 kegs, # D ..... 40%

10-c cans, 10 ..... 0%

10-c cans, 6 ..... 0%

than 10 ..... 10 10 8

**Enameled and Tinned Ware—** See Ware, Hollow.

**Escutcheon Pins—**

See Pins, Escutcheon.

**Escutcheons—**

Brass Thread ..... 60&60&10%

Door Lock ..... Same dis. as Door Locks.

Wood ..... 25%

**Expanded Metal—**

List No. 5.

Door Mats, Galvanized ..... 25%

Fencing, Painted Sheets ..... 20%

Lathing ..... 10%

Netting, Painted Sheets ..... 20%

Tree Guards, Paneled ..... 15%

Window Guards, Paneled ..... 15%

**Extractors, Lemon Juice—**

See Squeezers, Lemon.

**Fasteners, Blind—**

Austin & Eddy No. 2008 ..... # gr., \$9.00

Mackrell's, # doz., \$1.00 ..... 20&20&10%

Security Gravity ..... # gr., \$9.00

Van Sand's Old Pat., \$15 # gr. .... 55&10%

Van Sand's Screw Pat., \$15 # gr. .... 60&10%

Zimmerman's ..... 50&10%

**Faucets—**

B. & L. B. Co.

Burnside's Red Cedar ..... 50%

Burnside's Red Cedar, bbl. lots, 50&10%

Cork Lined ..... 70&5&70&10%

Fenn's ..... 40%

Fenn's Cork Stops ..... 35&40%

Frary's Pat. Petroleum ..... 60%

Metallic Key, Leather Lined ..... 60&10&10%

National Measuring, # doz., \$38.00, 25&10%

John Sommers'

Peerless Best Block Tin Key ..... 40%

IXL, 1st quality, Cork Lined ..... 40%

Diamond Lock ..... 40%

Perfection, F.R. Red Cedar (in boxes) 40%

Boss Metallic Key ..... 50%

Reliable Cork Lined ..... 60%

O. K. Western Pattern Cork Lined, 50%

No Brand, Red Cedar (in bbls.) ..... 60&10%

Western Pattern Metal Key ..... 40%

No Brand Metal Key ..... 60%

Self Measuring

Enterprise, # doz., \$38.00 ..... 25&10%

Lane's # doz., \$38.00 ..... 25&10%

Star ..... 60%

Star, Metal Plug, new list ..... 40%

Lockport, Metal Plug, reduced list ..... 60%

**Feloe Plates—**

See Plates, Feloe.

**Fibre Ware—** See Ware, Fibre.

**Fifth Wheels—**

Brewster ..... 50&5%

Derby and Cincinnati ..... 45&5%

**Files—**

**Domestic—**

American ..... 70&70&10%

Acme ..... 60&10&10%

G. & H. Barnett (Black Diamond) ..... 60&10&10%

Eagle ..... 60&10&10%

Nicholson Files, Rasps, &c. 60&10&10%

Nicholson (X.F.) Files ..... 25%

Nicholson's Royal Files (Seconds) ..... 75%

Other makers, best brand, 70&5&70&10%

Fair brands ..... 75&75&5%

Second quality ..... 80&80&10%

Arcade Horse Rasps ..... 50&10&10%

Chelsea Horse Rasps, Hand Cut, 50&10%

Heller's Horse Rasps ..... 50&10&10%

McCaffrey's Horse Rasps ..... 50&10%

Trojan Horse Rasps ..... 60&10&10%

**Imports—**

Butcher ..... Butcher's list, 20%

Stubbs' list 75&80%

**Fixtures Grindstone**

Moore's ..... 55%

P. S. & W. Co. .... 50&10%

Reading Hardware Co. .... 50&10%

Sargent's Patent ..... 70&10%

**Fluting Machines—**

See Machines, Fluting.

**Fodder Squeezers—**

See Squeezers, Fodder.

**Forks—**

Hay, Manure, &c. Asso. List, 70&70&5&5%

Hay, Manure, &c. Phila. List, 60&60&10&5%

Plated, see Spoons.

**Frames—Saw—**

Red, Polished and Varinised, # doz. .... \$1.50, 25%

White Vermont, # gro., \$9.00, 10.00

**Screen, Window and Door—**

Bonanza Window Screens, 50&50&10%

Cordland ..... 40&40&5%

Empire Fancy Screen Doors, # doz. .... 11%

Phillips' Window Screen Frames, # doz. .... 50&50&5%

Porter's Pat. Window and Door Frame, 38&40%

Stearns' Frames and Corners, 25&25&10%

Wabash Adjustable Window Screen, 40&5%

Warner's Screen Corner Irons, 33&40&10%

**Freezers, Ice Cream—**

American ..... 60%

Artic ..... 70&70&5%

Blissard ..... 70%

Boss and Pat. .... 60&10&10%

Buffalo Champion ..... 65&65&5%

Confectioners' Machine ..... 50%

Crown ..... 60%

Double Action Crown ..... 60%

Gem ..... 65&65&5%

Grant ..... 60%

Good Luck ..... 65&65&5%

Granite State ..... 65&65&5%

Keystone, P. D. & Co., each, \$1.50, 20%

Model ..... 60&60&5%

Ohio ..... 60&10%

Peerless ..... 60&10%

Shepard's Lightning ..... 65&65&5%

Standard Double Action ..... 60&60&5%

Star ..... 60%

White Mountain ..... 60&60&5%

Zero ..... 70%

**Fruit and Jelly Presses—**

See Presses, Fruit and Jelly.

**Fruit Pickers—**

See Pickers, Fruit.

**Fry Pans—** See Pans, Fry.

**Funnels—**

Gersdorff's Perfection, Standard and Globe, Tyn, 1 gro, 10%; 2 to 5 gro, 20%; 5 to 10 gro, 30%

Copper, 1 to 6 doz, 15%; 6 to 12 doz, 20%; over 12 doz ..... 25%

**Furnaces, Soldering—**

Burgess No. 3 Gem, Copper reservoir, \$8.50

Burgess No. 3 Gem tin reservoir, \$7.00

Clayton & Lambert No. 1 Fire Pot, complete ..... \$8.00

**Fuse—** Dis. 10&2% cash. # a 1000 ft.

Common Cotton Fuse, # doz. .... \$5.00

Common Hemp Fuse, for dry ground, 2.80

Double Taped Fuse, for very wet gr., 5.60

Single Taped Fuse, for wet ground, 4.75

Triple Taped Fuse, for very wet gr., 6.40

Large Gutta Percha Fuse, for water, 15.00

Small Gutta Percha Fuse, for water, 10.00

**Gates Molasses—**

Boss, # doz.

No. 1, \$7; No. 2, \$8; No. 3, \$9; No. 4, \$10 ..... 60&10&10%

Lincoln's Pattern ..... 70&70&10%

Stebbin's Genuine ..... 60&10&10%

Stebbin's Pattern ..... 80&10&10%

Stebbin's Tinned Ends ..... 40&10%

Weed's ..... 20&10%

**Gauges—**

Barrett's Comb. Roller Gauge, # doz. \$7.50, \$8.00

Hoague & Peck's Champion Gauge, # doz. \$5.00

With Scale ..... # doz. \$4.00

Without Scale ..... # doz. \$4.00

Marking, Mortise, &c. .... 60&10%

Stanley R. & L. Co.'s Butt and Rabbit Gauge ..... 25&10%

Starrett's Surface, Center and Scratch, 2&10%

Wire, Brown & Sharpe's ..... 10&20%

Wire, Morse's ..... 25%

Wire, P. S. & W. Co. .... 10&10%

Wire, Wheeler, Madden & Co. .... 10%

**Gimlets—**

Nail and Spike ..... 50&10&5%

Diamond Gimlets ..... # gr \$5.00

Eureka Gimlets ..... 60&10%

Double Cut, Douglas ..... 40&10%

Double Cut, Ives' ..... 60&60&5%

Double Cut, Shepardson's ..... 45&45&5%

**Glue—**

Dodd's Liquid Glue ..... 25&25&5%

Improved Process ..... 25&25&5%

Page's Liquid ..... 25&25&5%

Upton's Liquid ..... 35%

**Glue Pots—** See Pots, Glue.

**Grease, Axle—**

Axiene, tin boxes, # gross \$12.00

Dixon's Everlasting, 10-lb pails, ea. 85¢

Dixon's Everlasting, in bxs, # doz 1 m ..... \$1.20, 2 to 3 m ..... \$2.00

English Coach, 5-lb tin pails, doz, \$3.50

English Coach, wooden boxes, # gross \$8.50

Fraser's, in Kegs # D 4¢, Pail # D 5¢

Fraser's, in boxes, # gr \$9.50

Lower grades, special brands, # gr \$5.50, \$7.00

Tiger, 5-lb tin pails, # doz \$2.85

Tin, wooden boxes, # gross \$7.00

**Grindstones—**

Family, regular list ..... 60%

Family, Cleveland Stone Co. .... 20%

**Grindstone Fixtures—**

See Fixtures, Grindstone.

**Gun Powder—** See Powder.

**Hack Saws—** See Saws.

**Hafts Awl—**

Per, Pat. Leather Top, # doz ..... 45&50%

Per, Pat. Plain Top, # doz ..... 40&40%

Sewing, Bro's Pat. # gr ..... \$1.75

Sewing, P. S. Long, # doz \$1.30

Sewing, Pat. Short, # oz. .... 45&50%

**Halters—**  
 Covert's Adj. Rope Halters.....40&25  
 Covert's Adj. Web Halters.....85&50  
 Covert's Hemp Horse and Cattle Tie.....50&10&25  
 Covert's Jute Cattle Ties.....70&10&25  
 Covert's Jute Horse Ties.....70&25  
 Covert's Rope, 7-16 in. Jute.....70&25  
 Covert's Rope, 1/2 in. Hemp.....50&25  
 Covert's Rope, Jute.....60&10&10&25  
 Covert's Saddlery Works Halters.....55&45  
 Covert's Saddlery Works Handy Halters.....33&45  
 Covert's Saddlery Works Horse and Cattle Ties.....38&45

**Hammers—**  
**Handled Hammers—**  
 Atha Tool Co.....50&10  
 Buffalo Hammer Co.....50&10  
 Humason & Beckley.....50&10  
 Versee.....40&10  
 Cheney's Claw.....40&10  
 Cheney's Machinist's & Riveting.....50&25  
 O. Hammond & Son.....40&10  
 Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 & 1.75  
 Maydole's, Ist Dec., 1, 35.....25&10&35  
 Nelson Tool Works.....40&10  
 Peck, Stow & Wilcox.....35&40  
 Fayette R. Plumb.....40&10  
 Artisan's Choice, A. E. Nail.....40&10  
 Horseshoe Turning Hammers.....50  
 Regular Y. & P. A. E. Nail.....50&10  
 Other Hammers.....40&10  
 Sargent's.....40&10  
 Warner & Nobles, new list.....25&10

**Heavy Hammers and Sledges—**  
 3 lb and under.....\$2.40  
 5 lb.....\$3.85  
 7 lb.....\$5.15  
 10 lb.....\$6.40  
 15 lb.....\$7.70  
 20 lb.....\$9.00  
 25 lb.....\$10.30  
 30 lb.....\$11.60  
 35 lb.....\$12.90  
 40 lb.....\$14.20  
 45 lb.....\$15.50  
 50 lb.....\$16.80  
 55 lb.....\$18.10  
 60 lb.....\$19.40  
 65 lb.....\$20.70  
 70 lb.....\$22.00  
 75 lb.....\$23.30  
 80 lb.....\$24.60  
 85 lb.....\$25.90  
 90 lb.....\$27.20  
 95 lb.....\$28.50  
 100 lb.....\$29.80  
 105 lb.....\$31.10  
 110 lb.....\$32.40  
 115 lb.....\$33.70  
 120 lb.....\$35.00  
 125 lb.....\$36.30  
 130 lb.....\$37.60  
 135 lb.....\$38.90  
 140 lb.....\$40.20  
 145 lb.....\$41.50  
 150 lb.....\$42.80  
 155 lb.....\$44.10  
 160 lb.....\$45.40  
 165 lb.....\$46.70  
 170 lb.....\$48.00  
 175 lb.....\$49.30  
 180 lb.....\$50.60  
 185 lb.....\$51.90  
 190 lb.....\$53.20  
 195 lb.....\$54.50  
 200 lb.....\$55.80  
 205 lb.....\$57.10  
 210 lb.....\$58.40  
 215 lb.....\$59.70  
 220 lb.....\$61.00  
 225 lb.....\$62.30  
 230 lb.....\$63.60  
 235 lb.....\$64.90  
 240 lb.....\$66.20  
 245 lb.....\$67.50  
 250 lb.....\$68.80  
 255 lb.....\$70.10  
 260 lb.....\$71.40  
 265 lb.....\$72.70  
 270 lb.....\$74.00  
 275 lb.....\$75.30  
 280 lb.....\$76.60  
 285 lb.....\$77.90  
 290 lb.....\$79.20  
 295 lb.....\$80.50  
 300 lb.....\$81.80  
 305 lb.....\$83.10  
 310 lb.....\$84.40  
 315 lb.....\$85.70  
 320 lb.....\$87.00  
 325 lb.....\$88.30  
 330 lb.....\$89.60  
 335 lb.....\$90.90  
 340 lb.....\$92.20  
 345 lb.....\$93.50  
 350 lb.....\$94.80  
 355 lb.....\$96.10  
 360 lb.....\$97.40  
 365 lb.....\$98.70  
 370 lb.....\$100.00  
 375 lb.....\$101.30  
 380 lb.....\$102.60  
 385 lb.....\$103.90  
 390 lb.....\$105.20  
 395 lb.....\$106.50  
 400 lb.....\$107.80  
 405 lb.....\$109.10  
 410 lb.....\$110.40  
 415 lb.....\$111.70  
 420 lb.....\$113.00  
 425 lb.....\$114.30  
 430 lb.....\$115.60  
 435 lb.....\$116.90  
 440 lb.....\$118.20  
 445 lb.....\$119.50  
 450 lb.....\$120.80  
 455 lb.....\$122.10  
 460 lb.....\$123.40  
 465 lb.....\$124.70  
 470 lb.....\$126.00  
 475 lb.....\$127.30  
 480 lb.....\$128.60  
 485 lb.....\$129.90  
 490 lb.....\$131.20  
 495 lb.....\$132.50  
 500 lb.....\$133.80  
 505 lb.....\$135.10  
 510 lb.....\$136.40  
 515 lb.....\$137.70  
 520 lb.....\$139.00  
 525 lb.....\$140.30  
 530 lb.....\$141.60  
 535 lb.....\$142.90  
 540 lb.....\$144.20  
 545 lb.....\$145.50  
 550 lb.....\$146.80  
 555 lb.....\$148.10  
 560 lb.....\$149.40  
 565 lb.....\$150.70  
 570 lb.....\$152.00  
 575 lb.....\$153.30  
 580 lb.....\$154.60  
 585 lb.....\$155.90  
 590 lb.....\$157.20  
 595 lb.....\$158.50  
 600 lb.....\$159.80  
 605 lb.....\$161.10  
 610 lb.....\$162.40  
 615 lb.....\$163.70  
 620 lb.....\$165.00  
 625 lb.....\$166.30  
 630 lb.....\$167.60  
 635 lb.....\$168.90  
 640 lb.....\$170.20  
 645 lb.....\$171.50  
 650 lb.....\$172.80  
 655 lb.....\$174.10  
 660 lb.....\$175.40  
 665 lb.....\$176.70  
 670 lb.....\$178.00  
 675 lb.....\$179.30  
 680 lb.....\$180.60  
 685 lb.....\$181.90  
 690 lb.....\$183.20  
 695 lb.....\$184.50  
 700 lb.....\$185.80  
 705 lb.....\$187.10  
 710 lb.....\$188.40  
 715 lb.....\$189.70  
 720 lb.....\$191.00  
 725 lb.....\$192.30  
 730 lb.....\$193.60  
 735 lb.....\$194.90  
 740 lb.....\$196.20  
 745 lb.....\$197.50  
 750 lb.....\$198.80  
 755 lb.....\$200.10  
 760 lb.....\$201.40  
 765 lb.....\$202.70  
 770 lb.....\$204.00  
 775 lb.....\$205.30  
 780 lb.....\$206.60  
 785 lb.....\$207.90  
 790 lb.....\$209.20  
 795 lb.....\$210.50  
 800 lb.....\$211.80  
 805 lb.....\$213.10  
 810 lb.....\$214.40  
 815 lb.....\$215.70  
 820 lb.....\$217.00  
 825 lb.....\$218.30  
 830 lb.....\$219.60  
 835 lb.....\$220.90  
 840 lb.....\$222.20  
 845 lb.....\$223.50  
 850 lb.....\$224.80  
 855 lb.....\$226.10  
 860 lb.....\$227.40  
 865 lb.....\$228.70  
 870 lb.....\$230.00  
 875 lb.....\$231.30  
 880 lb.....\$232.60  
 885 lb.....\$233.90  
 890 lb.....\$235.20  
 895 lb.....\$236.50  
 900 lb.....\$237.80  
 905 lb.....\$239.10  
 910 lb.....\$240.40  
 915 lb.....\$241.70  
 920 lb.....\$243.00  
 925 lb.....\$244.30  
 930 lb.....\$245.60  
 935 lb.....\$246.90  
 940 lb.....\$248.20  
 945 lb.....\$249.50  
 950 lb.....\$250.80  
 955 lb.....\$252.10  
 960 lb.....\$253.40  
 965 lb.....\$254.70  
 970 lb.....\$256.00  
 975 lb.....\$257.30  
 980 lb.....\$258.60  
 985 lb.....\$259.90  
 990 lb.....\$261.20  
 995 lb.....\$262.50  
 1000 lb.....\$263.80  
 1005 lb.....\$265.10  
 1010 lb.....\$266.40  
 1015 lb.....\$267.70  
 1020 lb.....\$269.00  
 1025 lb.....\$270.30  
 1030 lb.....\$271.60  
 1035 lb.....\$272.90  
 1040 lb.....\$274.20  
 1045 lb.....\$275.50  
 1050 lb.....\$276.80  
 1055 lb.....\$278.10  
 1060 lb.....\$279.40  
 1065 lb.....\$280.70  
 1070 lb.....\$282.00  
 1075 lb.....\$283.30  
 1080 lb.....\$284.60  
 1085 lb.....\$285.90  
 1090 lb.....\$287.20  
 1095 lb.....\$288.50  
 1100 lb.....\$289.80  
 1105 lb.....\$291.10  
 1110 lb.....\$292.40  
 1115 lb.....\$293.70  
 1120 lb.....\$295.00  
 1125 lb.....\$296.30  
 1130 lb.....\$297.60  
 1135 lb.....\$298.90  
 1140 lb.....\$300.20  
 1145 lb.....\$301.50  
 1150 lb.....\$302.80  
 1155 lb.....\$304.10  
 1160 lb.....\$305.40  
 1165 lb.....\$306.70  
 1170 lb.....\$308.00  
 1175 lb.....\$309.30  
 1180 lb.....\$310.60  
 1185 lb.....\$311.90  
 1190 lb.....\$313.20  
 1195 lb.....\$314.50  
 1200 lb.....\$315.80  
 1205 lb.....\$317.10  
 1210 lb.....\$318.40  
 1215 lb.....\$319.70  
 1220 lb.....\$321.00  
 1225 lb.....\$322.30  
 1230 lb.....\$323.60  
 1235 lb.....\$324.90  
 1240 lb.....\$326.20  
 1245 lb.....\$327.50  
 1250 lb.....\$328.80  
 1255 lb.....\$330.10  
 1260 lb.....\$331.40  
 1265 lb.....\$332.70  
 1270 lb.....\$334.00  
 1275 lb.....\$335.30  
 1280 lb.....\$336.60  
 1285 lb.....\$337.90  
 1290 lb.....\$339.20  
 1295 lb.....\$340.50  
 1300 lb.....\$341.80  
 1305 lb.....\$343.10  
 1310 lb.....\$344.40  
 1315 lb.....\$345.70  
 1320 lb.....\$347.00  
 1325 lb.....\$348.30  
 1330 lb.....\$349.60  
 1335 lb.....\$350.90  
 1340 lb.....\$352.20  
 1345 lb.....\$353.50  
 1350 lb.....\$354.80  
 1355 lb.....\$356.10  
 1360 lb.....\$357.40  
 1365 lb.....\$358.70  
 1370 lb.....\$360.00  
 1375 lb.....\$361.30  
 1380 lb.....\$362.60  
 1385 lb.....\$363.90  
 1390 lb.....\$365.20  
 1395 lb.....\$366.50  
 1400 lb.....\$367.80  
 1405 lb.....\$369.10  
 1410 lb.....\$370.40  
 1415 lb.....\$371.70  
 1420 lb.....\$373.00  
 1425 lb.....\$374.30  
 1430 lb.....\$375.60  
 1435 lb.....\$376.90  
 1440 lb.....\$378.20  
 1445 lb.....\$379.50  
 1450 lb.....\$380.80  
 1455 lb.....\$382.10  
 1460 lb.....\$383.40  
 1465 lb.....\$384.70  
 1470 lb.....\$386.00  
 1475 lb.....\$387.30  
 1480 lb.....\$388.60  
 1485 lb.....\$389.90  
 1490 lb.....\$391.20  
 1495 lb.....\$392.50  
 1500 lb.....\$393.80  
 1505 lb.....\$395.10  
 1510 lb.....\$396.40  
 1515 lb.....\$397.70  
 1520 lb.....\$399.00  
 1525 lb.....\$400.30  
 1530 lb.....\$401.60  
 1535 lb.....\$402.90  
 1540 lb.....\$404.20  
 1545 lb.....\$405.50  
 1550 lb.....\$406.80  
 1555 lb.....\$408.10  
 1560 lb.....\$409.40  
 1565 lb.....\$410.70  
 1570 lb.....\$412.00  
 1575 lb.....\$413.30  
 1580 lb.....\$414.60  
 1585 lb.....\$415.90  
 1590 lb.....\$417.20  
 1595 lb.....\$418.50  
 1600 lb.....\$419.80  
 1605 lb.....\$421.10  
 1610 lb.....\$422.40  
 1615 lb.....\$423.70  
 1620 lb.....\$425.00  
 1625 lb.....\$426.30  
 1630 lb.....\$427.60  
 1635 lb.....\$428.90  
 1640 lb.....\$430.20  
 1645 lb.....\$431.50  
 1650 lb.....\$432.80  
 1655 lb.....\$434.10  
 1660 lb.....\$435.40  
 1665 lb.....\$436.70  
 1670 lb.....\$438.00  
 1675 lb.....\$439.30  
 1680 lb.....\$440.60  
 1685 lb.....\$441.90  
 1690 lb.....\$443.20  
 1695 lb.....\$444.50  
 1700 lb.....\$445.80  
 1705 lb.....\$447.10  
 1710 lb.....\$448.40  
 1715 lb.....\$449.70  
 1720 lb.....\$451.00  
 1725 lb.....\$452.30  
 1730 lb.....\$453.60  
 1735 lb.....\$454.90  
 1740 lb.....\$456.20  
 1745 lb.....\$457.50  
 1750 lb.....\$458.80  
 1755 lb.....\$460.10  
 1760 lb.....\$461.40  
 1765 lb.....\$462.70  
 1770 lb.....\$464.00  
 1775 lb.....\$465.30  
 1780 lb.....\$466.60  
 1785 lb.....\$467.90  
 1790 lb.....\$469.20  
 1795 lb.....\$470.50  
 1800 lb.....\$471.80  
 1805 lb.....\$473.10  
 1810 lb.....\$474.40  
 1815 lb.....\$475.70  
 1820 lb.....\$477.00  
 1825 lb.....\$478.30  
 1830 lb.....\$479.60  
 1835 lb.....\$480.90  
 1840 lb.....\$482.20  
 1845 lb.....\$483.50  
 1850 lb.....\$484.80  
 1855 lb.....\$486.10  
 1860 lb.....\$487.40  
 1865 lb.....\$488.70  
 1870 lb.....\$490.00  
 1875 lb.....\$491.30  
 1880 lb.....\$492.60  
 1885 lb.....\$493.90  
 1890 lb.....\$495.20  
 1895 lb.....\$496.50  
 1900 lb.....\$497.80  
 1905 lb.....\$499.10  
 1910 lb.....\$500.40  
 1915 lb.....\$501.70  
 1920 lb.....\$503.00  
 1925 lb.....\$504.30  
 1930 lb.....\$505.60  
 1935 lb.....\$506.90  
 1940 lb.....\$508.20  
 1945 lb.....\$509.50  
 1950 lb.....\$510.80  
 1955 lb.....\$512.10  
 1960 lb.....\$513.40  
 1965 lb.....\$514.70  
 1970 lb.....\$516.00  
 1975 lb.....\$517.30  
 1980 lb.....\$518.60  
 1985 lb.....\$519.90  
 1990 lb.....\$521.20  
 1995 lb.....\$522.50  
 2000 lb.....\$523.80  
 2005 lb.....\$525.10  
 2010 lb.....\$526.40  
 2015 lb.....\$527.70  
 2020 lb.....\$529.00  
 2025 lb.....\$530.30  
 2030 lb.....\$531.60  
 2035 lb.....\$532.90  
 2040 lb.....\$534.20  
 2045 lb.....\$535.50  
 2050 lb.....\$536.80  
 2055 lb.....\$538.10  
 2060 lb.....\$539.40  
 2065 lb.....\$540.70  
 2070 lb.....\$542.00  
 2075 lb.....\$543.30  
 2080 lb.....\$544.60  
 2085 lb.....\$545.90  
 2090 lb.....\$547.20  
 2095 lb.....\$548.50  
 2100 lb.....\$549.80  
 2105 lb.....\$551.10  
 2110 lb.....\$552.40  
 2115 lb.....\$553.70  
 2120 lb.....\$555.00  
 2125 lb.....\$556.30  
 2130 lb.....\$557.60  
 2135 lb.....\$558.90  
 2140 lb.....\$560.20  
 2145 lb.....\$561.50  
 2150 lb.....\$562.80  
 2155 lb.....\$564.10  
 2160 lb.....\$565.40  
 2165 lb.....\$566.70  
 2170 lb.....\$568.00  
 2175 lb.....\$569.30  
 2180 lb.....\$570.60  
 2185 lb.....\$571.90  
 2190 lb.....\$573.20  
 2195 lb.....\$574.50  
 2200 lb.....\$575.80  
 2205 lb.....\$577.10  
 2210 lb.....\$578.40  
 2215 lb.....\$579.70  
 2220 lb.....\$581.00  
 2225 lb.....\$582.30  
 2230 lb.....\$583.60  
 2235 lb.....\$584.90  
 2240 lb.....\$586.20  
 2245 lb.....\$587.50  
 2250 lb.....\$588.80  
 2255 lb.....\$590.10  
 2260 lb.....\$591.40  
 2265 lb.....\$592.70  
 2270 lb.....\$594.00  
 2275 lb.....\$595.30  
 2280 lb.....\$596.60  
 2285 lb.....\$597.90  
 2290 lb.....\$599.20  
 2295 lb.....\$600.50  
 2300 lb.....\$601.80  
 2305 lb.....\$603.10  
 2310 lb.....\$604.40  
 2315 lb.....\$605.70  
 2320 lb.....\$607.00  
 2325 lb.....\$608.30  
 2330 lb.....\$609.60  
 2335 lb.....\$610.90  
 2340 lb.....\$612.20  
 2345 lb.....\$613.50  
 2350 lb.....\$614.80  
 2355 lb.....\$616.10  
 2360 lb.....\$617.40  
 2365 lb.....\$618.70  
 2370 lb.....\$620.00  
 2375 lb.....\$621.30  
 2380 lb.....\$622.60  
 2385 lb.....\$623.90  
 2390 lb.....\$625.20  
 2395 lb.....\$626.50  
 2400 lb.....\$627.80  
 2405 lb.....\$629.10  
 2410 lb.....\$630.40  
 2415 lb.....\$631.70  
 2420 lb.....\$633.00  
 2425 lb.....\$634.30  
 2430 lb.....\$635.60  
 2435 lb.....\$636.90  
 2440 lb.....\$638.20  
 2445 lb.....\$639.50  
 2450 lb.....\$640.80  
 2455 lb.....\$642.10  
 2460 lb.....\$643.40  
 2465 lb.....\$644.70  
 2470 lb.....\$646.00  
 2475 lb.....\$647.30  
 2480 lb.....\$648.60  
 2485 lb.....\$649.90  
 2490 lb.....\$651.20  
 2495 lb.....\$652.50  
 2500 lb.....\$653.80  
 2505 lb.....\$655.10  
 2510 lb.....\$656.40  
 2515 lb.....\$657.70  
 2520 lb.....\$659.00  
 2525 lb.....\$660.30  
 2530 lb.....\$661.60  
 2535 lb.....\$662.90  
 2540 lb.....\$664.20  
 2545 lb.....\$665.50  
 2550 lb.....\$666.80  
 2555 lb.....\$668.10  
 2560 lb.....\$669.40  
 2565 lb.....\$670.70  
 2570 lb.....\$672.00  
 2575 lb.....\$673.30  
 2580 lb.....\$674.60  
 2585 lb.....\$675.90  
 2590 lb.....\$677.20  
 2595 lb.....\$678.50  
 2600 lb.....\$679.80  
 2605 lb.....\$681.10  
 2610 lb.....\$682.40  
 2615 lb.....\$683.70  
 2620 lb.....\$685.00  
 2625 lb.....\$686.30  
 2630 lb.....\$687.60  
 2635 lb.....\$688.90  
 2640 lb.....\$690.20  
 2645 lb.....\$691.50  
 2650 lb.....\$692.80  
 2655 lb.....\$694.10  
 2660 lb.....\$695.40  
 2665 lb.....\$696.70  
 2670 lb.....\$698.00  
 2675 lb.....\$699.30  
 2680 lb.....\$700.60  
 2685 lb.....\$701.90  
 2690 lb.....\$703.20  
 2695 lb.....\$704.50  
 2700 lb.....\$705.80  
 2705 lb.....\$707.10  
 2710 lb.....\$708.40  
 2715 lb.....\$709.70  
 2720 lb.....\$711.00  
 2725 lb.....\$712.30  
 2730 lb.....\$713.60  
 2735 lb.....\$714.90  
 2740 lb.....\$716.20  
 2745 lb.....\$717.50  
 2750 lb.....\$718.80  
 2755 lb.....\$720.10  
 2760 lb.....\$721.40  
 2765 lb.....\$722.70  
 2770 lb.....\$724.00  
 2775 lb.....\$725.30  
 2780 lb.....\$726.60  
 2785 lb.....\$727.90  
 2790 lb.....\$729.20  
 2795 lb.....\$730.50  
 2800 lb.....\$731.80  
 2805 lb.....\$733.10  
 2810 lb.....\$734.40  
 2815 lb.....\$735.70  
 2820 lb.....\$737.00  
 2825 lb.....\$738.30  
 2830 lb.....\$739.60  
 2835 lb.....\$740.90  
 2840 lb.....\$742.20  
 2845 lb.....\$743.50  
 2850 lb.....\$744.80  
 2855 lb.....\$746.10  
 2860 lb.....\$747.40  
 2865 lb.....\$748.70  
 2870 lb.....\$750.00  
 2875 lb.....\$751.30  
 2880 lb.....\$752.60  
 2885 lb.....\$753.90  
 2890 lb.....\$755.20  
 2895 lb.....\$756.50  
 2900 lb.....\$757.80  
 2905 lb.....\$759.10  
 2910 lb.....\$760.40  
 2915 lb.....\$761.70  
 2920 lb.....\$763.00  
 2925 lb.....\$764.30  
 2930 lb.....\$765.60  
 2935 lb.....\$766.90  
 2940 lb.....\$768.20  
 2945 lb.....\$769.50  
 2950 lb.....\$770.80  
 2955 lb.....\$772.10  
 2960 lb.....\$773.40  
 2965 lb.....\$774.70  
 2970 lb.....\$776.00  
 2975 lb.....\$777.30  
 2980 lb.....\$778.60  
 2985 lb.....\$779.90  
 2990 lb.....\$781.20  
 2995 lb.....\$782.50  
 3000 lb.....\$783.80  
 3005 lb.....\$785.10  
 3010 lb.....\$786.40  
 3015 lb.....\$787.70  
 3020 lb.....\$789.00  
 3025 lb.....\$790.30  
 3030 lb.....\$791.60  
 3035 lb.....\$792.90  
 3040 lb.....\$794.20  
 3045 lb.....\$795.50  
 3050 lb.....\$796.80  
 3055 lb.....\$798.10  
 3060 lb.....\$799.40  
 3065 lb.....\$800.70  
 3070 lb.....\$802.00  
 3075 lb.....\$803.30  
 3080 lb.....\$804.60  
 3085 lb.....\$805.90  
 3090 lb.....\$807.20  
 3095 lb.....\$808.50  
 3100 lb.....\$809.80  
 3105 lb.....\$811.10  
 3110 lb.....\$812.40  
 3115 lb.....\$813.70  
 3120 lb.....\$815.00  
 3125 lb.....\$816.30  
 3130 lb.....\$817.60  
 3135 lb.....\$818.90  
 3140 lb.....\$820.20  
 3145 lb.....\$821.50  
 3150 lb.....\$822.80  
 3155 lb.....\$824.10  
 3160 lb.....\$825.40  
 3165 lb.....\$826.70  
 3170 lb.....\$828.00  
 3175 lb.....\$829.30  
 3180 lb.....\$830.60  
 3185 lb.....\$831.90  
 3190 lb.....\$833.20  
 3195 lb.....\$834.50  
 3200 lb.....\$835.80  
 3205 lb.....\$837.10  
 3210 lb.....\$838.40  
 3215 lb.....\$839.70  
 3220 lb.....\$841.00  
 3225 lb.....\$842.30  
 3230 lb.....\$843.60  
 3235 lb.....\$844.90  
 3240 lb.....\$846.20  
 3245 lb.....\$847.50  
 3250 lb.....\$848.80  
 3255 lb.....\$850.10  
 3260 lb.....\$851.40  
 3265 lb.....\$852.70  
 3270 lb.....\$854.00  
 3275 lb.....\$855.30  
 3280 lb.....\$856.60  
 3285 lb.....\$857.9



Plate.....33%&25  
 Romer's Night Latches.....15%  
 R. & E. Mfg. Co., list Mar. 20, 1889.....60&10/70  
 Sargent & Co. Lts. Atg. 1.78. 60&10/70  
 Warner's Burglar Proof. 50. 60.00, 50  
 Yale.....net prices

## Elevator—

Moore's.....33%&45

## Padlocks—

Wrought Iron Padlocks:  
 Brittan, Graham & Mathes, list  
 Jan. 1894.....75%  
 Mallory, Wheeler Co., list Jan. 1,  
 1894.....75%  
 Norwich Lock Mfg. Co., list June  
 10, 1891.....50&25  
 Russell & Erwin Mfg. Co., list June  
 10, 1891.....50&25  
 Sargent & Co., list January 1, 1894  
 75%  
 William Wilcox Mfg. Co., list Janu-  
 ary 1, 1894.....75&20%  
 Ames Sword Co. up to No. 150.....40%  
 Ames Sword Co. above No. 150.....50%  
 Barnes Mfg. Co.....40&40&10%  
 Champion Padlocks.....40%  
 A. E. Deltz.....40%  
 Eagle.....40%  
 Eureka, Eagle Lock Co.....40&25%  
 E. T. Frahm's Keystone Scandinavian  
 No. 41 line.....90&40%  
 120 line.....90&25%  
 109 line.....65%  
 510 line.....70&10%  
 225, 610 and 200 lines.....70%  
 All other numbers.....50&25%  
 Horseshoe.....75%  
 Hotchkiss.....30%  
 Rock's.....30%  
 Romer's Nos. 0 to 91.....30%  
 Romer's Scandinavian, &c., Nos. 100 to  
 505.....15%  
 Scandinavian.....90&50%  
 Slaymaker, Barry & Co.....90&50%  
 No. 1010 line.....90&50%  
 No. 41 line.....90%  
 No. 61 line.....60%  
 No. 21 line.....80%  
 Star.....60%  
 Yale Lock Mfg. Co.'s.....net prices

## Sash, &amp;c.—

Attwell Mfg. Co.....25&33%  
 Champion Safetylist January, 1893, 70&5%  
 Clark's No. 1, \$10; No. 2, \$8 gr.....38%  
 Common Sense, Jap'd, Cop'd and  
 Br'ed.....gr \$4.00  
 Common Sense, Nickel Plated.....gr \$10.00  
 Corbin's Daisy, list Feb. 15, 1888.....70%  
 Davis Bronze, Barnes Mfg. Co.....60%  
 Ferguson's.....33%  
 Fish (Liesche's pat.), No. 100, gr. \$8;  
 No. 105, gr. \$10.....50%  
 Giant, list Jan. 1892.....70&25%  
 Hammond's Window Springs.....25&25%  
 Hugunin's New Sash Locks.....25&25%  
 Hugunin's Sash Balances.....25&25%  
 Ives' Patent.....60&10&50&10&10%  
 Kempshall's Gravity.....60%  
 Kempshall's Model.....60&60&10%  
 Monarch.....50%  
 Payson's Perfect.....60&10&10%  
 Reading.....60&10&60&10&10%  
 Security.....70%  
 Universal.....30%  
 Victor.....60&10&25%  
 Walker's.....10%  
 Wolcott's.....60&10&25%

## Lumber Tools—

See Tools, Lumber.

## Lustro—

Four-ounce bottles.....75%  
 gross.....\$17.00

## Machines.

## Boring—

Without Augers, Upright, Angular.

Boss, Carpenters' 3.60  
 Boss, Ship Bldrs' 3.85  
 Douglas.....\$5.50 \$6.75.....50%  
 Jennings' 5.60 6.75.....50&50&5%  
 Millers Falls.....7.60.....25%  
 Phillips' Patent  
 with Auger.....7.00 7.50.....  
 Snell's, Rice's Pat 5.60 6.75. 40&10&10%

## Fluting—

American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,  
 \$4.50 each.....35%  
 Combined Fluter and Sad Iron.....35%  
 Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in.,  
 \$5.50 each.....35%  
 Crown Hand Fluter, No. 1, \$15.00; 2,  
 \$12.50; 3, \$10.00; 4, \$8.25.....35%  
 Crown Jewel, 6 in.....\$3.50 each, 35%  
 Domestic Fluter.....each, \$1.50  
 Eagle, 8 1/4-inch Rolls, \$2.15.....35%  
 Eagle, 5 1/2-inch Rolls, \$2.85.....35%  
 Geneva Hand Fluter, White Metal.....\$2 each, 25%  
 Knox, 4 1/2-inch Rolls.....\$3.25 each 35%  
 Knox, 6-inch Rolls.....\$3.60 each 35%  
 Shepard Hand Fluter, No. 85, per doz  
 \$15.50.....40%  
 Shepard Hand Fluter No. 95, 75 doz  
 \$3.00.....40%  
 Shepard Hand Fluter, No. 110, 75 doz  
 \$11.00.....40%

## Hoisting—

Moore's Anti-Friction Differential Pul-  
 ley Block.....20%  
 Moore's Hand Hoist, with Lock Brake, 20%  
 Moore's Rope Differential Pulley  
 Block.....80%  
 Maris & Beekley (Teal Patent).....30%  
 See also Blocks.

## Washing—

Fair and Square.....75%  
 Anthony Wayne, 75%  
 No. 2, \$30; No. 3, \$42.....  
 Wayne American.....75%  
 Wisconsin.....75%  
 Western Star 75%  
 No. 2, \$38; No. 3,  
 \$39

## Mallets—

B. & L. Block Co., Hickory & L. V.  
 30&10&40%  
 Vibre Head, Stearns.....33%  
 Hickory.....20&10&20&10&10%  
 Lignumvite.....20&10&20&10&10%

## Mattocks—Regular list.

60&10&60&10&5%

## Measures—

standard Fibreware, No. 1, peck 7  
 dozen. \$3.60; 1/2-peck, \$3.90

## Meat Cutters—

See Cutters, Meat.

## Menders, Harness—

Per doz.....\$2.75

## Milk Cans—See Cans, Milk.

## Mills—

## Coffee—

Box and Side, list Jan. 1, 1888.....60&60&5%  
 Net prices are often made which are  
 lower than above discount.  
 American, Enterprise Mfg. Co., list Jan.  
 17, 1893.....20%  
 National List, Jan. 1, 1894.....30%  
 Swift, Lane Bros.....30%  
 Waddell's New Box Mills, Ideal  
 Brand, New List.....60%

## Mincing Knives—

See Knives, Mincing.

## Molasses Gates—

See Gates, Molasses.

## Money Drawers—

See Drawers, Money.

## Mowers, Lawn—

Highest 10 in. 12 in. 14 in.  
 grade, \$4.00 to \$25 \$4.50 to \$6.00 \$5.00 to \$6.75  
 Good \$3.00 \$3.25 \$3.50  
 Cheap.....2.25 2.50 2.75

## Muzzles—

Safety.....75%  
 doz, \$3.00, 25%

## Nails—

Cut and Wire. See Trade Report.

Wire Nails, Papered.  
 Association list, May 1, '92.....85&10%  
 55&10&5%  
 Hungarian, Finishing, Upholsterers', &c.  
 See Tacks.

## Horse—

Nos. 6 7 8 9 10  
 A. C.....25% 23% 22% 21% 21%  
 American.....9% 9% 9% 9% 9%  
 Anchor.....23% 21% 20% 19% 18%  
 Ausable.....23% 24% 24% 24% 23%  
 Capewell.....19% 18% 17% 16% 16%  
 C. B. K.....25% 23% 22% 21% 21%  
 Champion.....25% 23% 22% 21% 20%  
 Champlain.....23% 24% 24% 24% 23%  
 Clinton, Fin.....19% 17% 16% 15% 14%  
 Empire Bronzed.....11%  
 Essex.....23% 24% 24% 24% 23%  
 Lyra.....9% 9% 9% 9% 9%  
 Maud S.....25% 23% 22% 21% 21%  
 Northwest'n.....25% 23% 22% 21% 20%  
 Putnam.....23% 21% 20% 19% 18%  
 Snowden.....9% 9% 9% 9% 9%  
 Standard.....23% 21% 20% 19% 18%  
 Vulcan.....23% 21% 20% 19% 18%  
 Western.....23% 21% 20% 19% 18%

## Picture—

Brass Head, Combination list.....50&10%  
 Brass Head, Sargent's list.....60&60&10%  
 Porcelain Head, Combination list.....40&10%  
 Porcelain Head, Sargent's list.....50&10&10%  
 Niles' Patent.....40%

## Nail Pullers—See Pullers, Nail.

## Nail Sets—See Sets, Nail.

## Nut Crackers—

See Crackers, Nut.

## Nuts—List Dec. 18, 1889.

Square, Hex.  
 Cold Punched.....5.00 6.10 off list  
 Hot Pressed.....5.80 6.50 off list  
 In packages of 100 lb, add 1-10%  
 net; in packages less than 100 lb, add  
 1/2% net.

## Oakum—

Best or Government.....75%  
 Navy.....75%  
 U. S. Navy.....75%

## Oil Tanks—See Tanks, Oil.

## Oilers—

Brass and Copper.....50&10&50&10&5%  
 Zinc and Tin.....70&70&10%  
 Broughton's Brass.....50%  
 Broughton's Zinc.....50%  
 Malleable, Hammers' Improved, No. 1,  
 \$3.60; No. 2, \$4.00; No. 3, \$4.40 10 doz.  
 10&10&5%  
 Malleable, Hammers' Old Pattern, same  
 list.....45%  
 Olmstead's Brass.....50%  
 Olmstead's Tin and Zinc.....50%  
 Prior's Pat. or "Paragon" Brass.....50%  
 Prior's Pat. or "Paragon" Zinc.....50%  
 Steel, Draper & Williams.....50%  
 Whitcomb & Hobbs Mfg. Co., Steel Anti-  
 Rust.....60%

## Openers, Can—

American.....gr \$1.75 to \$2.00  
 Champion 75%  
 Domestic, 75%  
 Duplex.....75%  
 Eureka.....75%  
 Excelsior, No. 1 \$2.50; No. 2, \$1.50.....40%  
 French, No. Brass.....75%  
 Iron Handle, No. 5.....gr \$2.00, 45&50%  
 Lyman's.....gr \$3.75, 20%  
 Messenger's Comet.....gr \$3.00, 25%  
 Moore's.....70%  
 Sardine Scissors.....75%  
 Sprague, No. 1, 55¢; 2, 60¢; 3, 65¢  
 Star.....75%  
 Universal.....75%  
 World's Best gr gross No. 1, \$12.00;  
 No. 2, \$24.00; No. 3, \$36.00.....50&10%

## Packing, Steam—

## Rubber—

Standard, fair quality.....70&10&75%  
 Inferior quality.....75&10&80%  
 Extra.....60&35&10&5%  
 Jenkins' Standard.....25&25&5%  
 N. Y. B. & P. Co., Double Diamond.....40%  
 N. Y. B. & P. Co., Sausmader.....45%  
 N. Y. B. & P. Co., Carbon.....70&35%

## Miscellaneous—

American Packing.....9% 10% 10%  
 Cotton Packing.....14% 15% 15%  
 Italian Packing.....12% 14% 14%  
 Jute.....6% 7% 7%  
 Russia Packing.....13% 14% 14%

## Pails—

## Creamery—

S. S. & Co.: 18-qt., \$7.00; 20-qt., \$7.25  
 75%  
 doz.....5%

## Galvanized Pails—

Light.....Heavy.  
 10 Quart.....\$2.00 \$2.25 \$2.25 to \$2.50  
 12 Quart.....2.25 to 2.50 2.50 to 2.75  
 14 Quart.....2.50 to 2.75 2.75 to 3.00

## Galvanized Buckets—

Fire.....Well.  
 10 Quart.....\$2.50 to \$2.75  
 12 Quart.....2.75 to 3.00 \$3.25 to \$3.50  
 14 Quart.....3.00 to 3.25 2.50 to 2.75

## Indurated Fiber Ware

Fire Pails, deep.....75%  
 Fire Pails, round bottom.....75%  
 Milk 14 qt.....75%  
 Stable, 14 qt.....75%  
 Star Pails, 12 qt.....75%

## Standard Fiber Ware—

Buggy Pails.....3.00  
 Chamber Pails, 14 qt.....6.00 \$7.00  
 Dairy Pails, 14 qt.....3.75 4.25  
 Fire Pails, No. 1, 12 qt., 75%  
 Fire Pails, No. 2, 14 qt., 75%  
 Storage Pails.....4.00  
 Sugar Pails (bal. trap).....5.00 8.50  
 Water Pails, 12 qt., 75%  
 3.15 3.75

## Pans—

## Dripping—

Large sizes.....75%  
 Small sizes.....75%  
 Silver & Co. (Covered).....40%

## Fry—

Standard list:  
 No.....0 1 2 3 4  
 doz.....\$3.00 \$3.75 \$4.25 4.75 \$5.25  
 No.....5 6 7 8 9  
 doz.....\$6.00 \$6.75 \$7.00 \$7.50 \$8.00  
 Polished, regular goods.....75&75&10%  
 Acme Fry Pans.....60&10%

## Steel Edge, No. 1.....75%

## Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, \$2; 20,  
 \$2.25; 30, \$2.50 each.....60&10%

## Paper and Cloth—

## Sand and Emery—

List April 19, 1888.....50&10&60%  
 Sibley's Emery and Crocus Cloth.....30%

## Parers—

## Apple—

Advance.....75%  
 Baldwin.....75%  
 Bonanza.....each 5.00  
 Daisy.....each 4.00  
 Dandy.....each 7.50  
 Empire.....each 4.00  
 Eureka, 1889.....each 16.00  
 Family Bay State.....75%  
 Favorite.....75%  
 Gold Medal.....75%  
 Ideal.....75%  
 Improved Bay State.....75%  
 Little Star.....75%  
 New Lighting.....75%  
 Oriole.....75%  
 Penn.....75%  
 Perfection.....75%  
 Pomona.....75%  
 Reading 72.....75%  
 Reading 73.....75%  
 Rocking Table.....75%  
 Turn Table.....75%  
 Victor.....75%  
 Waverly.....75%  
 White Mountain.....75%

## Potato—

Antrim Combination.....75%  
 Hoosier.....75%  
 Saratoga.....75%  
 White Mountain.....75%

## Pencils, Soapstone—

See Crayons.

## Pickers, Fruit—

Prize Fruit Pickers.....60%  
 Railroad Adze Eye, 5 to 6, \$12.00; 6  
 to 7, \$13.00.....60&10&10&70%

## Picture Nails—

See Nails, Picture.

## Pinking Irons—

See Irons, Pinking.

## Pins—

## Bow—

Humason, Beckley & Co.'s.....60&10%  
 Peck, Stow & W. Co.'s.....50&10&50&10&5%  
 Sargent & Co.'s, \$17 and \$18.....60&10%

## Escutcheon—

Brass.....70%  
 Iron, list Nov. 11, 1885.....75%

## Pipe, Wrought Iron—

1 1/2 and under, Plain.....67%  
 1 1/2 and under, Galv.....67%  
 1 1/2 and over, Plain.....67%  
 1 1/2 and over, Galv.....67%  
 Boiler Tubes, list Oct. 24, 1889.....65&10&10&10%  
 Casing, list Nov. 18, 1892, 52%  
 Cold Drawn Seamless Steel Tubing.....50%  
 Inserted Joints Casing, list Nov. 18,  
 1892.....47%  
 Steel Boiler Tubes.....27%  
 50&10&10&5%

## Planes and Plane Irons—

## Wood Planes—

Molding.....40&10&50%  
 Bench, First quality.....45&10&55%  
 Bench, Second quality.....60&10&60&5%  
 Bailey's (Stanley R. & L. Co.).....50&10%  
 Bailey's Iron Planes.....50&50&5%  
 Davis' Iron Planes.....50&50&5%  
 Gage Tool Co.'s Self-Setting.....20&10&10%  
 Meriden Mal. Iron Co.'s.....50&50&5%  
 Miscellaneous Planes (Stanley R. & L.  
 Co.).....25&10%  
 Sargent's.....60&10&10%  
 Standard Tool Co.'s.....50&50&5%  
 Steers' Iron Planes.....60&50&5%

## Plane Irons—

Auburn Thistle.....30&10&30&10&10%  
 Buck Bros.....75%  
 Purcher's.....\$5.00 to \$5.25 10  
 Ohio.....30&10&30&10&10%  
 Sandusky.....30&10&30&10&10%

## Stanley R. &amp; L. Co.....50&amp;10%

## L. &amp; J. White.....75%

## Plates—

Felloe.....75%  
 doz.....60&60&10%

## Pliers and Nippers—

Button's Patent.....60%  
 Carey's Pat. Wire Cutters.....50%  
 Cronk's 8 in., \$15.00; 10 in.....\$30  
 Cronk's Button Pattern.....50&10&50%  
 Cronk's Carrier Pliers.....60&60&5%  
 Eureka Pliers and Nippers.....40%  
 Gas Pliers.....60%  
 Gas Pliers, Custer's Nickel Plated, 60&5%  
 Hall's No. 2, 5 in., \$18.50; No. 4, 7 in.,  
 \$21.00 75%  
 Humason & Beckley Mfg. Co. 50&50&10%  
 Lindsay's Giant.....38%  
 Morrill's Parallel, 75%  
 F. S. & W. Cast Steel.....50&50&5%  
 F. S. & W. Timmers' Cutting Nippers.....40%  
 Russell's Parallel.....25%

## Plumbs and Levels—

Regular list.....75&10&75&10&10%  
 Cook's.....40&10%  
 Davis inclinometers.....10&10%  
 Davis Iron Levels.....50%  
 Diston's.....50%  
 Pocket Levels.....70&10&70&10&10%  
 Stanley's Duplex.....20&10%  
 Stanley's Handy.....20&10%

## Poachers, Egg—

Buffalo Steam Egg Poachers, 75%  
 No. 1, \$6.00; No. 2, \$9.00.....33%  
 Silver & Co., 6-Ring, 75%  
 Ring.....\$2.00

## Pokes, Animal—

Bishop's American.....75%  
 Bishop's I. X. L.....75%  
 Bishop's Steel Monarch.....75%  
 Bishop's Ohio.....75%  
 Bishop's Pioneer.....75%  
 Bolding.....75%  
 Buckeye, Single Stale.....75%  
 Eagle, Double Stale.....75%  
 Eagle, Single Stale.....75%  
 Metallic Horse Pokes.....75%

## Police Goods—

Daley's Improved Handcuffs; 2 Hands,  
 Polished, 75%  
 \$57.00; 3 hands, Polished, 75%  
 \$72.00; Nickel, \$84.00.....25%  
 J. P. Lovell's Police Goods.....25%  
 Newhall Ship Chandlery Co., Hand-  
 cuffs, \$15.00 75%  
 Towers's.....25%

## Polish—

## Metal—

Gaston's Silver Compound.....33%  
 Prestoline.....30%  
 Prestoline Paste.....33%  
 Taitte Mills:  
 Paste, 1/2 lb tins.....gr. \$14.40  
 Paste, 1 lb tins.....gr. \$36.00  
 Liquid, 1/2 pint.....gr. \$36.00  
 Powder, 1 lb.....gr. \$36.00

## Stove—

Black Eagle Benzine Paste, 5 and 10 lb  
 cans.....12%  
 Black Flag.....75%  
 Black Flag 5 and 10 lb cans.....75%  
 Black Flag, liquid, in bottles, gro. 75%  
 Black Jack Water Paste, 5 and 10 lb  
 cans.....12%  
 Bonnell's Liquid Stove Polish, gro. 80%  
 Bonnell's Paste Stove Polish, gro. 80%  
 Bonnett's Noon Day.....gr. \$13.00  
 Crown Paste.....gr. \$7.20  
 Crown Paste in 5 and 10 lb pails.....gr. \$12%  
 Diamond O. K. Enamel.....gr. \$19.00  
 Diamond Rock Nickel Cleaner.....gr. \$10.20

Joseph Dixon's.....gr. \$10.20  
 Dixon's Plumbago.....gr. \$6.00, 10%  
 Fireclay.....gr. \$2.50  
 Gem.....gr. \$4.50, 10%  
 Gold Medal.....gr. \$8.00, 25%  
 Japanese.....gr. \$3.50  
 Jet Black.....gr. \$3.50  
 Lustrous.....gr. \$4.75  
 Nickel Plate Paste.....gr. \$6.00  
 Parlor Pride Stove Enamel, gro.  
 Raven Liquid, 8 oz. bottles.....gr. \$3.00</





**Snaps, Harness, &c.**

|   |
|---|
| Anchor 1 & 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000 |
|---|

**Snaths**

|                               |     |
|-------------------------------|-----|
| John Prots Snaths.....        | 50¢ |
| Sargent's Patent Guarded..... | 70¢ |
| Scythe.....                   | 50¢ |

**Soldering Irons**

See *Irons, Soldering*.

**Spittoons, Cuspidors, &c.**

Standard Fiberware—

Cuspidors, 5½-inch, # doz., No. 6, \$8; No. 5X, \$9.

Spittoons, Daisy, 8-inch, No. 1, 4 10 and 11 inch, \$8.

**Spoke Shaves**

See *Shaves, Spoke*.

**Spoke Trimmers**

See *Trimmers, Spoke*.

**Spoons and Forks**

Tinned Iron—

Basting, Cen. Stamp. Co.'s list..... 70¢

Buffalo, S. S. & Co., Cen. Stamp. Co.'s list..... 70¢

Solid Table and Tea, Cen. Stamp. Co.'s list..... 70¢

**Silver Plated**

4 months or 63 cash 30 days:

L. Boardman & Son..... 50¢

Holmes & Edwards Silver Co..... 15¢

Meriden Brit. Co., Rogers..... 40¢

Reed & Barton..... 40¢

Rogers & Pines..... 40¢

C. Rogers & Bros..... 40¢

Rogers & Hamilton..... 40¢

Wm. Rogers Mfg. Co..... 40¢

Simpson, Hall, Miller & Co..... 40¢

**Miscellaneous**

Boardman's Britannia Spoons, case lots..... 60¢

Boardman's Nickel Silver, list July 1, 1891..... 60¢

Britannia..... 60¢

German Silver..... 60¢

Nickel Silver..... 60¢

Holmes & Edwards Silver Co.:  
No. 24 German Silver..... 60¢

No. 30 Silver Metal..... 60¢

No. 49 Nickel Silver..... 60¢

No. 50 Nickel Silver..... 60¢

No. 67 Mexican Silver..... 60¢

Rogers & Hamilton:  
Cimeter, Flatware..... 40¢

Cimeter, Steel Goods..... 40¢

Crown Hamilton, Flatware and Cutlery..... 40¢

Steel Goods..... 40¢

Wm. Rogers Mfg. Co.:  
18¢ Rogers' German Silver..... 60¢

22¢ Rogers' Nickel Silver..... 60¢

Rogers' Silver Metal..... 60¢

**Spring Door**

Champion (Coll.)..... 60¢

Cowell's, No. 1, # doz. \$18.00; No. 2, \$16.00..... 60¢

Gem (Coll.), list April 19, 1886..... 20¢

Hercules..... 50¢

Phenix..... 39¢

Rubber, complete, # doz. \$4.50..... 55¢

Star (Coll.), list April 19, 1886..... 20¢

Torrey's Coll. \$9 in. # doz. \$10.00; 12 in. # doz. \$11.00..... 55¢

Victor (Coll.)..... 60¢

**Carriage, Wagon, &c.**

Elliptic, Concord, Platform and Half Scroll..... 60¢

Our Bolster Springs..... 25¢

**Sprinklers, Law**

Gibbs' Arc..... # doz., \$12.00

Gibbs' Hustler..... # doz., \$8.00

**Squares**

Nickel-Plated..... # doz. \$10.00

Steel and Iron..... # doz. \$10.00

Try Square and T Bevels..... 60¢

Avery's Level Protractor..... 50¢

Avery's Flush Level Square..... 40¢

Diston's Try Square and T Bevel..... 50¢

Starrett's Micrometer Caliper Squares..... 25¢

Winterbottom's Try and Miter..... 30¢

**Squeezers****Fodder**

Blair's..... # doz. \$2.00

Blair's "Climax"..... # doz. \$1.25

**Lemon**

Porcelain Lined, No. 1..... # doz. \$6.00

Wood, Common..... # doz. \$1.70

Wood, No. 2..... # doz. \$3.00

Dean's, No. 1, # doz. \$6.50; 2, \$5.35; 3, \$4.10; 4, \$2.85..... 25¢

Dunlap's Improved..... # doz. \$3.75

Hotchkiss Straight Flash..... # doz. \$12.00

Jennings' Star..... # doz. \$2.50

King..... 40¢

Little Giant..... 50¢

Sammis..... No. 1, \$5.00; No. 2, \$9; 12, \$18 # doz..... 25¢

The Boss..... # doz. \$2.50

**Standard Fiber Ware**

See *Fiber, Standard*.

**Staples**

Barbed Blind, 4 in. and larger, # doz. \$7.50

Barbed Blind, 4 in. # doz. \$8.00

Fence Staples, Galvanized, # doz. \$1.00

Fence Staples, Plain, # doz. \$1.00

Grand Crossing Tack Co.'s list..... 75¢

C. & A. Hoffmann's..... 40¢

Nichols Bros..... 40¢

Blacksmith's..... 35¢

Waterford Goods..... 25¢

Gardner..... 25¢

Green River..... 25¢

Lightning Screw Plate..... 25¢

Rece's New Screw Plates..... 25¢

Reversible Ratchet..... 30¢

Stone Grind—See *Grindstones*.

Scythe Stones..... 35¢

Pike Mfg. Co., list April, 1892..... 35¢

Cleveland Stone Co., list Nov. 1892..... 35¢

**Oil Stones, &c.**

|  |        |
|--|--------|
| Pike Mfg. Co.:<br>Hindustan No. 1, # doz. \$3.00 | 40¢    |
| Sand Stone.....                                  | 10¢    |
| Turkey Oil Stone, 4 to 8 in.....                 | 80¢    |
| Turkey Slips.....                                | 35¢    |
| Rosy Red Washita.....                            | 60¢    |
| Lilly White Washita.....                         | 60¢    |
| Washita Stone, Extra.....                        | 50¢    |
| Washita Stone, No. 1.....                        | 40¢    |
| Washita Stone, No. 2.....                        | 30¢    |
| Lilly White Slips.....                           | 80¢    |
| Rosy Red Slips.....                              | 80¢    |
| Washita Slips, Extra.....                        | 80¢    |
| Washita Slips, No. 1.....                        | 70¢    |
| Arkansas Stone, No. 1, 3 to 5 in.....            | 25¢    |
| Arkansas Stone, No. 1 5½ to 8 in.....            | 35¢    |
| Lake Superior.....                               | 13¢    |
| Lake Superior Slips.....                         | 20¢    |
| Tanite Mills:<br>Emery Oil.....                  | \$9.00 |

**Stops, Bench**

Cincinnati..... 25¢

Crecent..... # doz. \$1.50

Hotchkiss..... # doz. \$5, 10 to \$10.00

McGills # doz \$3..... 10¢

Millers Falls..... 25¢

Morrill's, # doz. No. 1, \$10.00; No. 2, \$11.00..... 20¢

Stearns..... 20¢

Terrell's Nos. 1 and 2, # doz. \$3; No. 3, \$5.60..... 30¢

Weston's, No. 1, \$10; No. 2, \$9.25 to \$10.55..... 50¢

**Stove Polish**

See *Polish, Stove*.

**Stretchers Carpet**

Cast Iron, Steel Polished..... # doz. \$2.25

Socket..... # doz. \$1.75

Bullard's..... 25¢

**Strops Razor**

Badger's Belt and Com..... # doz. \$2.00

Campbell Cutlery Co..... Net prices

Electric Cutlery Co..... Net prices

Genuine Emerson..... 60¢

Imitation..... # doz. \$2.00, 20 to \$2.50

Jordan's Pat. Padded, list Nov. 1, '89, 50¢

Lamont Combination..... # doz. \$4.00

Torrey's..... Net prices

**Stuffer Sausage**

Miles' Challenge, # doz. \$10.00..... 50¢

Perry, # doz. No. 1, \$16.00; No. 2, \$21.00..... 50¢

Draw Cut No. 4, each \$30.00..... 2

### Whips

| American Whip Co.: Length.                              | 4 1/2   | 5     | 5 1/2 | 6     | 6 1/2 | 7      | 7 1/2  | 8 ft.             |
|---|---------|-------|-------|-------|-------|--------|--------|-------------------|
| X. L. Whalebone Driving.....                            | \$18.00 | 20.00 | 22.00 | 24.00 | 27.00 | 30.00  | 33.00  | 36.00             |
| Eureka, Two-thirds Whalebone.....                       | 15.00   | 16.50 | 18.00 | 20.00 |       |        |        |                   |
| Bull Bone, Half-length Whalebone.....                   |         |       | 11.00 | 12.00 | 13.00 | 15.00  |        |                   |
| American Standard.....                                  | 8.00    | 8.50  | 9.50  | 10.50 | 12.00 | 13.50  | 15.00  | 16.50             |
| True Grip, Raw Hide Center.....                         | 6.00    | 6.00  | 6.50  | 7.00  | 7.50  | 9.00   |        |                   |
| New Name, Stocked Java, Black and Wine Colors.....      |         |       |       | 6.00  |       |        |        |                   |
| American, 98 Pen Whip.....                              |         |       |       | 6.00  |       |        |        |                   |
| Gents' Light Driving No. 111.....                       |         |       |       | 6.00  |       |        |        |                   |
| Gents' Light Driving No. 106.....                       |         |       |       | 6.00  |       |        |        |                   |
| Hand-made Stocked Java No. 108.....                     |         |       | 8.75  | 4.00  |       |        |        |                   |
| A large variety of cheaper grades.....                  |         |       |       |       |       | 50¢    | \$3.00 |                   |
| Team Whips.....   |         |       |       |       |       | \$2.00 | \$7.50 |                   |
| Toy Whips.....  |         |       |       |       |       |        |        | \$2.00 to \$12.00 |
| Hardware Assortment, 10/American, 75 Whips for \$50.00. |         |       |       |       |       |        |        |                   |

### Wire and Wire Goods—

#### Iron—

#### Market,

|                              |                   |
|------------------------------|-------------------|
| Br. & Ann. Nos. 0 to 18..... | 75¢ to 76¢ 10/105 |
| Cop'd, Nos. 0 to 18.....     | 76¢ 10/105        |
| Galv., Nos. 0 to 18.....     | 70¢ 10/105        |
| Tin'd, Nos. 0 to 18.....     | 70¢ 10/105        |

#### Stone,

|  |            |
|--|------------|
| Br. and Ann'd, Nos. 10 to 18.....      | 80¢        |
| Nos. 19 to 26.....                     | 80¢ 10/105 |
| Nos. 27 to 36.....                     | 82¢ 10/105 |
| Annseled Wire on Spools.....           | 80¢        |
| Brass, list Jan. 18, 1884.....         | 40¢ 10/105 |
| Copper, list Jan. 18, 1884.....        | 40¢ 10/105 |
| Galvanized Fence.....                  | 75¢ 10/105 |
| Malin's An'aled & Tin'd on Spools..... | 60¢ 10/105 |
| Malin's Brass and Cop. on Spools.....  | 50¢ 10/105 |

Per Dozen.

Steel Music Wire, 12 to 80, imported.....  
 Stubs' Steel Wire.....  
 Tate's Spooled, Tin'd & Annealed.....  
 Tinned Broom Wire, 18 to 21, 1/2".....  
 Wire Cloth Line, see Lines.....  
 Wire Picture Cord, see Cord.

### Bright Wire Goods—

Standard list.....

### Wire Cloth and Netting—

Galvanized Wire Netting.....

Painted Screen Cloth 100 ft \$1.40 to \$1.45

### Wire Barb—

See Trade Report.

### Wire Rope—See Rope, Wire.

### Wrenches—

|                                   |                  |
|-----------------------------------|------------------|
| American Adjustable.....          | 40¢              |
| Baxter's Adjustable "S".....      | 40¢ to 10¢ 50¢   |
| Baxter's Diagonal.....            | 60¢              |
| Coe's Genuine.....                | 50¢ to 10¢ 50¢   |
| Coe's "Mechanics".....            | 50¢ to 10¢ 50¢   |
| Girard Standard.....              | 55¢ to 10¢ 50¢   |
| Lamson & Sessions' Engineers..... | 60¢ to 10¢       |
| Lamson & Sessions' Standard.....  | 70¢ to 10¢       |
| Girard Agricultural.....          | 75¢ 10¢ & 80¢ 5¢ |
| P. S. & W. Agricultural.....      | 80¢ 5¢           |
| W. & B. Diamond.....              | 50¢ 10¢          |
| Acme, Bright.....                 | 40¢ 5¢           |
| Acme, Nickle.....                 | 40¢ 5¢           |

|                                 |                    |
|---------------------------------|--------------------|
| Aiken's Pocket (Bright).....    | \$6.00, 50¢ to 10¢ |
| Alligator.....                  | 25¢ to 5¢          |
| Always Ready.....               | 35¢ to 5¢          |
| Benn's & Call's.....            | 30¢ to 10¢         |
| Briggs' Pattern.....            | 40¢ to 10¢         |
| Combination Black.....          | 40¢ to 10¢         |
| Combination Bright.....         | 40¢ to 10¢         |
| Cylinder or Gas Pipe.....       | 45¢ to 10¢         |
| Extra Heavy.....                | 45¢                |
| Merrick's Pattern.....          | 45¢                |
| No. 8 Pipe Bright.....          | 55¢                |
| Bit Wrench, Adj., Tatum's.....  | \$2.25, 25¢ to 10¢ |
| Boardman's.....                 | 30¢                |
| Cincinnati Brace Wrenches.....  | 25¢ to 10¢         |
| Diamond Steel.....              | 55¢ to 10¢         |
| Diamond Engineer.....           | 20¢ to 10¢         |
| Eagle.....                      | 50¢ to 10¢         |
| Hercules.....                   | 70¢ to 10¢         |
| Tate's Vice Wrench.....         | 55¢ to 10¢ 5¢      |
| The Favorite Pocket.....        | \$4.00, 40¢        |
| Walker's.....                   | 55¢ to 10¢         |
| Webster's Pat. Combination..... | 25¢                |

### Wringers, Clothes—

|   |         |
|---|---------|
| Am. Wringer Co., list July 1, 1893.....             | 2¢ cash |
| Colby Wringer Co., list Sept. 1, 1891.....          | 2¢ cash |
| Lovell Mfg. Co., list July 1, 1892.....             | 2¢ cash |
| Peerless Mfg. Co., list Feb., 1892.....             | 2¢ cash |
| National Wringer & Mfg. Co., list June 1, 1892..... | 2¢ cash |

### Wrought Goods—

Staples, Hooks, &c., list, March 17, 1893.....  
 85¢ to 10¢ 85¢ to 15¢

## Paints, Oils and Colors.—Wholesale Prices.

### Animal and Vegetable Oils—

|   |     |
|---|-----|
| Linseed, City, raw.....                     | 52¢ |
| Linseed, City, boiled.....                  | 50¢ |
| Linseed, Western, raw.....                  | 50¢ |
| Lard, City, Extra Winter.....               | 64¢ |
| Lard, City, Prime.....                      | 64¢ |
| Lard, City, Extra No. 1.....                | 64¢ |
| Lard, City, No. 1.....                      | 64¢ |
| Lard, Western, prime.....                   | 63¢ |
| Cotton-seed, Crude, prime.....              | 27¢ |
| Cotton-seed, Crude, made on grades.....     | 25¢ |
| Cotton-seed, Summer Yellow, prime.....      | 32¢ |
| Cotton-seed, Summer Yellow, off grades..... | 31¢ |
| Sperm, Crude.....                           | 63¢ |
| Sperm, Natural Spring.....                  | 68¢ |
| Sperm, Bleached Spring.....                 | 68¢ |
| Sperm, Natural Winter.....                  | 68¢ |
| Sperm, Bleached Winter.....                 | 73¢ |
| Whale, Crude.....                           | 44¢ |
| Whale, Natural Winter.....                  | 44¢ |
| Whale, Bleached Winter.....                 | 47¢ |
| Whale, Extra Bleached.....                  | 43¢ |
| Sea Elephant, Bleached Winter.....          | 25¢ |
| Menhaden, Crude, Sound.....                 | 25¢ |
| Menhaden, Crude, Southern.....              | 25¢ |
| Menhaden, Light Pressed.....                | 34¢ |
| Menhaden, Bleached Water.....               | 38¢ |
| Menhaden, Extra Bleached.....               | 45¢ |
| Tallow, City, prime.....                    | 45¢ |
| Tallow, Western, prime.....                 | 45¢ |
| Cocoanut, Ceylon.....                       | 54¢ |
| Cocoanut, Cochinchina.....                  | 64¢ |
| Cod, Domestic.....                          | 38¢ |
| Cod, Foreign.....                           | 40¢ |
| Red Elaine.....                             | 35¢ |
| Red Saponified.....                         | 44¢ |
| Bank.....                                   | 35¢ |
| Strait.....                                 | 38¢ |
| Olive, Italian, bbls.....                   | 58¢ |
| Neatsfoot, prime.....                       | 60¢ |
| Palm, prime, Lagos.....                     | 54¢ |

### Mineral Oils—

|   |     |
|---|-----|
| Black, 29 gravity, 25 @ 30 cold test..... | 7¢  |
| Black, 29 gravity, 15 cold test.....      | 7¢  |
| Black, 29 gravity, summer.....            | 54¢ |

### Paints and Colors—

|   |         |
|---|---------|
| Barytes, Foreign, b ton.....  | \$22.00 |
| Barytes, Amer. doated.....  | \$23.00 |
| Barytes, Amer. No. 1.....   | \$16.00 |
| Barytes, Amer. No. 2.....   | \$13.00 |
| Barytes, Amer. No. 3.....   | \$11.00 |
| Blue, Celestial.....  | 6¢      |
| Blue, Chinese.....  | 40¢     |
| Blue, Prussian.....   | 25¢     |
| Blue, Ultramarine.....  | 8¢      |
| Brown, Spanish.....   | 1¢      |
| Brown, Vandyke, Amer.....   | 3¢      |
| Brown, Vandyke, English.....  | 6¢      |
| Carmine, No. 40, in bulk.....   | 2.75¢   |
| Carmine, No. 40, in boxes.....  | 2.85¢   |
| Carmine, No. 40, in ounces.....   | 3.75¢   |
| Chalk, in bulk.....   | 1.75¢   |
| Chalk, in bbls.....   | 33¢     |
| China Clay, English.....  | 18.00¢  |
| Cobalt Oxide, prep'd.....   | 9.00¢   |
| Cobalt Oxide, black.....  | 1.90¢   |
| Cobalt Oxide, black.....  | 1.90¢   |
| Green, Paris, in bulk.....  | 20¢     |
| Green, Paris, 170 @ 175 b.....  | 20 1/2¢ |
| Green, Paris, small pack.....   | 22¢     |
| Rebates—3¢ @ 10 on lots of 10,000 b or over; 2 1/2¢ @ 1000 to 10,000 b; 2¢ @ 2000 to 4000 b; 1 1/2¢ @ 1000 to 2000 b; 1¢ @ 500 to 1000 b purchased during the season. |         |
| Green, Chrome, ordinary.....  | 6¢      |
| Green, Chrome, pure.....  | 22¢     |
| Lead, Eng. B.B. White.....  | 7¢      |
| Lead, Amn. White.....   | 4 1/2¢  |
| Dry.....  | 5 1/2¢  |
| In Oil.....   | 5 1/2¢  |
| Lead, White, in oil, 25 b tin.....  | 1¢      |
| Lead, White, in oil, 12 1/2 b tin.....  | 1¢      |
| Lead, White, add to keg price.....  | 1¢      |
| Lead, White, in oil, 1 to 5 b as sorted tins, add to keg price.....   | 2 1/2¢  |

|                                       |        |
|---------------------------------------|--------|
| Lead, Red, bbls. and 1/2 bbls.....    | 5 1/2¢ |
| Lead, Red, kegs.....                  | 5 1/2¢ |
| Litharge, kegs.....                   | 5 1/2¢ |
| Litharge, bbls. and 1/2 bbls.....     | 5 1/2¢ |
| Ocher, Rochelle.....                  | 1.35¢  |
| Ocher, French Washed.....             | 1 1/2¢ |
| Ocher, German Washed.....             | 1 1/2¢ |
| Ocher, Tuscan.....                    | 1 1/2¢ |
| Orange Mineral, English.....          | 7 1/2¢ |
| Orange Mineral, French.....           | 10¢    |
| Orange Mineral, German.....           | 7 1/2¢ |
| Orange Mineral, American.....         | 7 1/2¢ |
| Red, Indian, English.....             | 5¢     |
| Red, Indian, American.....            | 2¢     |
| Red, Turkey.....                      | 9¢     |
| Red, Venetian, American.....          | 7¢     |
| Red, Venetian, English.....           | 1.10¢  |
| Sienna, Italian, Burnt and Powd.....  | 4¢     |
| Sienna, Ital., Burnt Lumps.....       | 1 1/2¢ |
| Sienna, Ital., Raw, Powd.....         | 4 1/2¢ |
| Sienna, Ital., Raw, Lumps.....        | 1 1/2¢ |
| Sienna, American, Raw.....            | 1 1/2¢ |
| Sienna, American, Burnt and Powd..... | 1 1/2¢ |
| Talc, French.....                     | 1 1/2¢ |
| Talc, American.....                   | 1 1/2¢ |
| Terra Alba, English.....              | 65¢    |
| Terra Alba, English.....              | 65¢    |
| Terra Alba, American No. 1.....       | 65¢    |
| Terra Alba, American No. 2.....       | 45¢    |
| Umber, Turkey, Burnt and Powd.....    | 2 1/2¢ |
| Umber, Turkey, Raw and Powd.....      | 2 1/2¢ |
| Umber, Turkey, R'w Lumps.....         | 2 1/2¢ |
| Umber, Turkey, B't Amer.....          | 1 1/2¢ |
| Umber, Turkey, R'w Amer.....          | 1 1/2¢ |
| Yellow, Chrome.....                   | 10¢    |
| Vermilion, American Lead.....         | 11¢    |
| Vermilion, Quicksilver, bulk.....     | 43¢    |
| Vermilion, Quicksilver, bag.....      | 44¢    |
| Vermilion, Quicksilver sm'r pkgs..... | 52¢    |
| Vermilion, English Import.....        | 55¢    |
| Vermilion, Imitation, Eng.....        | 8¢     |
| Vermilion, Trieste.....               | 90¢    |
| Vermilion, Chinese.....               | 85¢    |
| Whiting Common.....                   | 40¢    |
| Whiting Gliders.....                  | 50¢    |
| Zinc, American, dry.....              | 3 1/2¢ |
| Zinc, French, Red Seal.....           | 7¢     |

|  |         |
|--|---------|
| Zinc, French, Green Seal.....  | 8 1/2¢  |
| Zinc, French, V. M. X.....   | 6¢      |
| Zinc, Antwerp, Red Seal.....   | 6¢      |
| Zinc, Antwerp, Green Seal.....   | 6¢      |
| Zinc, German, L. Z. O.....   | 5¢      |
| Zinc, V. M. in Poppy Oil.....  | 10 1/2¢ |
| lots less than one ton.....  | 11¢     |
| Zinc, V. M. in Poppy Oil.....  | 10 1/2¢ |
| lots of 1 ton and over.....  | 10 1/2¢ |
| lots of less than 1 ton.....   | 10 1/2¢ |
| Discounts—French Zinc—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1¢; 25 bbls. 2¢; 50 bbls. 4¢. No discount allowed on less than bbl. lots. |         |

### Colors in Oil—

|                               |     |
|-------------------------------|-----|
| Black, Drop, Frankfurt.....   | 25¢ |
| Black, Drop, English.....     | 12¢ |
| Black, Drop, Domestic.....    | 7¢  |
| Black, Lampblack, Best.....   | 20¢ |
| Black, Lampblack, Common..... | 7¢  |
| Black, Ivory.....             | 35¢ |
| Blue, Chinese.....            | 35¢ |
| Blue, Prussian.....           | 20¢ |
| Blue, Ultramarine.....        | 12¢ |
| Brown, Vandyke.....           | 7¢  |
| Green, Chrome.....            | 8¢  |
| Green, Paris.....             | 18¢ |
| Sienna, Raw.....              | 7¢  |
| Sienna, Burnt.....            | 7¢  |
| Umber, Raw.....               | 7¢  |
| Umber, Burnt.....             | 7¢  |

### Putty—

|                              |       |
|------------------------------|-------|
| In barrels and 1/2 bbls..... | .013¢ |
| In tubs.....                 | .013¢ |
| In tin cans.....             | .013¢ |
| In bladders.....             | .013¢ |

### Spirits Turpentine—

|                      |         |
|----------------------|---------|
| In regular bbls..... | 30¢     |
| In machine bbls..... | 30 1/2¢ |

### Glue—

|                   |     |
|-------------------|-----|
| Low Grade.....    | 7¢  |
| Cabinet.....      | 11¢ |
| Medium White..... | 12¢ |
| Extra White.....  | 18¢ |
| French.....       | 10¢ |
| English.....      | 10¢ |
| Irish.....        | 10¢ |

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